BRIT. PHARMACOPOEIAL DRUG PLANTS

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DISTRIBUTION OF BRITISH PHARMACOPOEIAL DRUG PLANTS AND THEIR SUBSTITUTES GROWING IN INDIA

by

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and

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FOREWORD

"Distribution of British Pharmacopoeial Drug Plants and Their Substitutes Growing in India"—is an important part of the Scheme for *Survey, Cultivation and Improvement in the quality of Medicinal Plants* growing in India for which the Council of Scientific & Industrial Research have given a grant. This investigation although necessarily slow and laborious, as it means extensive touring of the whole country, study of local plants and herbaria, is of prime importance to the drug industry in India. The Survey of Medicinal and Poisonous Plants of India was originally started in 1935 by my co-workers and myself when the Indian Council of Agricultural Research gave a grant for the Medicinal Plants and Food Poisons Enquiry. It was carried on till 1947 when that Enquiry came to an end. Although much was accomplished considerable amount remained to be done. I, therefore, applied to the Board of Scientific and Industrial Research for a grant to continue and complete these investigations which intimately concern the drug industry in this country. I am very grateful to the Council of Scientific and Industrial Research for giving the necessary grant which has enabled us to complete this part of the work.

I have no doubt that the publication of the results of work done by Mr. S. L. Nayar and Dr. I. C. Chopra, will be useful to the drug industry in India. It will also greatly interest research workers, botanists, drug collectors, dealers in drugs and others. It is, therefore, gratifying that the Council are publishing it in the form of a brochure.

R. N. Chopra
Chairman
Pharmaceuticals and Drugs
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Drug Research Laboratory
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INTRODUCTION

The distribution of drug plants recognized in the *British Pharmacopoeia* and their substitutes growing in India, either in a state of nature or under cultivation, is dealt with in the following pages. This work which has involved considerable labour is of particular importance to the drug industry in India. The distribution of many plants as described in the old literature is often vague, and inaccuracies have crept in which have been passed from one publication to another on the subject. During the last ten years or so, we have tried to study, as thoroughly as possible, the localities of availability of medicinal plants in India by intensive tours all over the country and by actually collecting authentic specimens of plants. In this connexion, the Botanist visited different parts of India and made collections. In addition most of the important herbaria in the country such as those at Sibpur, Dehra Dun, Lahore, Ahmadabad, Baroda, Shillong, Madras and Trivandrum were scrutinized, and the relevent literature was consulted.

A large number of medicinal plants mentioned in the *British Pharmacopoeia* grow in India in a state of nature. A number of plants grow in the country which, though not identical with those plants used in the Pharmacopoeia, possess properties and actions similar to the Pharmacopoeial drug plants and form excellent substitutes. These plants are of economic importance. Besides the above two groups, there are those which do not naturally grow in this country but can be, and are being, successfully cultivated.

India is a veritable emporium of medicinal plants; nearly three-fourths of the drugs mentioned in the British and other pharmacopoeias grow here in a state of nature. India possesses climatic conditions varying from the torrid to the frigid zone. It embraces vast tracts of tropical plains, temperate hills and valleys, irrigated regions, and moist and dry climates. Labour is cheap and abundant. It has in fact been described as an epitome of climates, seasons and soils. It is, therefore, possible that most of the drugs

which do not naturally grow within her bounds could be easily cultivated. Acclimatisation is possible to a large extent with almost any plant, and there are many instances where plants, indigenous in one country and originally marketed from one country only, have been introduced into the other countries and established on a firm basis. For this reason, we have suggested areas for taking up the cultivation of those pharmacopoeial drugs which are not found in India, either in a state of nature or under cultivation. The names of areas and localities of distribution as mentioned under the different plants, provide an indication that these areas and localities will be suitable for taking up the cultivation of the particular plant on a commercial scale.

The plants have been arranged alphabetically according to their botanical names. The names of localities of distribution, as also the names of different States in which they are located, have also been arranged alphabetically. Besides the distribution of these plants, the common *British Pharmacopœia* name of the drugs, the part or parts which constitute the drug, as also their uses are mentioned briefly.

The authors frequently receive enquiries from all parts of India and abroad, from State Governments, medical men, agriculturists, drug dealers, commercial concerns and private individuals, regarding the distribution of medicinal plants in India, areas and places of their availability, their substitutes, areas and places suitable for their cultivation, etc. In view of this, we have thought it necessary to record our findings so that they may be readily available for reference purposes.

DISTRIBUTION OF BRITISH PHARMACOPOEIAL DRUG PLANTS AND THEIR SUBSTITUTES GROWING IN INDIA

1. **Abies sibirica** Ledeb. (*Coniferae*)

(B.P. 1932)

OIL OF SIBERIAN FIR : Oil of Siberian Fir is the oil distilled from the fresh leaves of this plant.

USES : Oil of Siberian Fir is used in inhalations and cheap perfumery.

DISTRIBUTION : The plant is not found in India. The tree is chiefly found in north-east Russia. Its cultivation may be tried in India in the temperate and sub-alpine Himalaya at altitudes of 7,000—13,000 ft.

2. **Acacia senegal** Willd. (*Leguminosae*)

Vernacular names : Rajputana—*Kumta;* Sanskrit—*Sveta khadira;* Sind—*Khor.*

ACACIA : Acacia is the dried gum obtained from the stem and branches of this plant and of some other species of *Acacia.*

USES : Acacia is employed medicinally as a demulcent; pharmaceutically it is used as an emulsifying agent and also to impart viscosity to mixtures containing insoluble and heavy powders.

DISTRIBUTION : A small tree found on the dry rocky hills of Sind, in south-east Punjab, in the northern Aravalli hills and other parts of Rajputana. *Baroda*—Gorinja forest, Amreli; Okhla Port (all over); *Bombay State*—Modosa, Ahmadabad Dist.; Prantij, Ahmadabad Dist.; Vasterapur near Ahmadabad; *East Punjab*—Rohtak; *Rajputana*—Ajmer; Aravalli Hills; near Dednor; between Bhim and Todgarh; Erinpura; Jodhpur; near Kishengarh.

INDIAN SUBSTITUTE : **Acacia arabica** Willd. (*Leguminosae*)

Vernacular names : Bengal—*Babul;* Bombay—*Kikar;* Hindi—*Babul;* Punjab—*Kikar;* Tamil—*Karuvel.*

DISTRIBUTION : A most widely distributed and prevalent tree, cultivated or self-sown throughout the greater part of India, save in the most humid regions on the coast. It is chiefly seen on village sites, borders of fields, canal embankments or waste lands, where it is usually gregarious. Stunted trees are occasionally found as high as 3,000—4,000 ft., in the north-west Himalaya. It is indigenous to Sind, the Deccan and tropical Africa, and is naturalized in all parts of India. The largest tracts under this tree are to be found in Sind (1,70,000 acres). Extensive areas under this plant are also seen in Berar, and on the alluvial loam in northern India and the Punjab. It is not so abundant in the south, and is rare in the extreme north-west on account of its inability to withstand frost. *Bombay State*—Ahmadabad; Ahmadanagar; Gujarat; Hijapur, Dharwar Dist.; Jeur to Wanjuli, Ahmadanagar Dist.; Khandesh East ; Khodad, Poona Dist.; Poona; Shelarwadi, Poona Dist.; Sholapur; Surat; *Delhi*—Delhi; *East Punjab*—Amritsar; *Jammu and Kashmir State*—Billawar, Jammu; Mirpur; Muzaffarabad; Udhampur; *Madhya Pradesh*—Akola; Darwha range, Yeotmal Dist.; Dhanor, Akola; Mana, Akola; *Madras State*—Chittor Dist.; Coimbatore; Madras; Porumamilla, Cuddapah Dist.; Vinukonda range, Guntur Dist.; *Rajputana*—Mahwabir, Ajmer; Merwara; *Travancore State*—near Trivandrum; *Uttar Pradesh*—Ghuma forest near Bharatpur; Gola, Kheri Dist.; Saharanpur Siwaliks; Surajbagh, Dehra Dun; *West Bengal*—Sibpur Royal Botanic Garden, Calcutta.

3. **Aconitum napellus** Linn. *(Ranunculaceae)*

Vernacular names : Bengal—*Bish;* Hindi—*Mitha zahar.*

ACONITE : Aconite consists of the dried roots of this plant.

USES : Aconite is used internally in fevers and externally for neuralgia and rheumatism.

DISTRIBUTION : The plant is not found in India. It is a perennial herbaceous plant growing in the mountainous districts of Europe, Asia and North America, and is cultivated in England. Its cultivation may be tried in the temperate Alpine Himalaya, from 10,000—15,000 ft., Sach Pass in

Chamba, to the highest limit of vegetation in the N.W. Provinces.

INDIAN SUBSTITUTE : **Aconitum chasmanthum** Stapf ex Holmes *(Ranunculaceae)*

Vernacular names : Hindi—*Mohri;* Kashmir—*Banbalnag.*

DISTRIBUTION : A biennial plant which occurs on the sub-alpine and alpine zone of the Western Himalaya, Chitral, Hazara, and is widely distributed throughout the Kashmir valley in high plateaus between 7,000—12,000 ft. *Jammu & Kashmir State*—Baramula; Burzil; Butta Sums; Darlah; Gangabal, Sonemarg; Gulmarg, 8,000 ft.; Gurez, 8,000 ft.; Kalapani, 10,000—11,000 ft. Gilgit Wazarat; Kamri, Kazinag; Khillanmarg; Kosarnag; Nichnai Pass; Rattu, Kamri valley, 9,000 ft.; Razdhani on Gilgit road; Sankar Gurch, 9,600 ft., Gilgit Wazarat; Shundur Pass, 9,600 ft., Gilgit Wazarat; Tilel Hills and valley; Vavjan; Vishnuser, Sonemarg.

4. **Aloe species** *(Liliaceae)*

ALOES : Aloes is the liquid, evaporated to dryness, which drains from the leaves cut from various species of Aloe.

USES : Aloes is widely employed as a purgative.

INDIAN SUBSTITUTE : **Aloe barbadensis** Mill. *(Liliaceae)*

Vernacular names : Bengal—*Ghirtakumari;* Hindi—*Ghi-kavar;* Tamil—*Kattalai.*

DISTRIBUTION : The plant is met with in cultivation throughout India and has also run wild, as on the coasts of South India. *Bombay State*—Ahmadabad, Gujarat College garden; Bombay gardens; *East Punjab*—Amritsar; Ludhiana; *Jammu and Kashmir State*—Muzaffarabad; *Uttar Pradesh*—Dehra Dun gardens.

5. **Andira araroba** Aguiar (*Leguminosae*)

(B.P. 1932)

CHRYSAROBIN : Chrysarobin is a mixture of substances obtained from araroba, a substance found in cavities in the trunk of this plant, by extracting it with hot benzene, evaporating the solution, and powdering the residue.

USES : Chrysarobin is used in various skin diseases, particularly psoriasis and eczema.

DISTRIBUTION : The plant is not found in India. A large tree grows in the damp forests of Bahia, Brazil. Its cultivation may be tried in the damp forests of Bengal particularly in the Teesta valley below Darjeeling.

6. **Anethum graveolens** Linn. *(Umbelliferae)*

Vernacular names : Bengal—*Shulpa;* Hindi—*Soya.*

DILL : Dill consists of the dried ripe fruits of this plant.

USES : Dill is used as a stimulant, aromatic and carminative.

DISTRIBUTION : A small annual herb, found throughout India, and often cultivated in the cold season for use as a vegetable. *Assam* —Dhubri, Goalpara Dist.; Margherita, Lakhimpur Dist.; Sadiya, Lakhimpur Dist.; Talap, Lakhimpur Dist.; Udalguri, Darrang Dist.; *Baroda*—Baroda; *Bombay State*—Bombay; Matheran; Poona; Sholapur; *East Punjab*—Amritsar; *Uttar Pradesh*—Banda; Hasanpur, Gonda Dist.; Lucknow; Saharanpur; *West Bengal*—Sibpur Royal Botanic Garden, Calcutta.

7. **Arachis hypogaea** Linn. *(Leguminosae)*

Vernacular names : Bengal—*Chiner badam;* Bombay—*Bhui muga;* Hindi—*Mungphali;* Tamil—*Nilakkadalai.*

ARACHIS OIL : Arachis oil is the fixed oil, expressed from the seeds of this plant.

USES : Arachis oil is nutritious, demulcent and mildly laxative.

DISTRIBUTION : An annual herb generally cultivated throughout India. The chief centres of production are as follows : *Madras State* —Central districts of Chittor, North and South Arcot, Salem, Trichinopoly and Coimbatore, Ceded districts of Cuddapah, Kurnool, Bellary and Anantpur and the Circars districts of Vizagapatam, E. and W. Godavari, Kistna and Guntur; *Bombay State*—W. and E. Khandesh, Satara, Sholapur, Bijapur, Belgaum; *Saurashtra*—Bhavnagar, Junagadh, Nawanagar and Gondal; *Madhya Pradesh*— Buldana, Akola, Amraoti and Nimar; *Hyderabad*—Gulbarga,

Osmanabad, Bhir, Raichur and Mahboobnagar; *Mysore*—Chitaldrug, Tumkur and Kolar.

8. **Aristolochia reticulata** Nutt. *(Aristolochiaceae)*
(B.P. 1932)

SERPENTARY : Serpentary consists of the dried rhizome and roots of the plant.

USES : Serpentary is employed as an aromatic bitter.

DISTRIBUTION : The plant is not found in India. A small herbaceous plant with a perennial rhizome, indigenous to the United States of America and is mainly grown in Texas. Its cultivation may be tried in the tropical and sub-temperate regions of the Deccan Peninsula in India.

9. **Artemisia cina Berg.** *(Compositae)*

SANTONIN : Santonin is a crystalline principle, which may be obtained from the dried unexpanded flowerheads of this plant and other species of Artemisia.

USES : Santonin is used as anthelmintic especially for round worms.

DISTRIBUTION : The plant is not found in India. A small undershrub which grows plentifully in Turkestan. Its cultivation may be tried in the temperate regions of the Kashmir Himalayas at altitudes of 7,000—11,000 ft.

INDIAN SUBSTITUTE : (i) **Artemisia brevifoli** Wall. *(Compositae)*
Vernacular names : Hindi—*Kirmala;* Kashmir—*Murni.*

DISTRIBUTION : It is a perennial herb, grows wild in the western Himalayas from Kashmir to Kumaon at altitudes of 7,000 ft. to 9,000 ft. It also grows in certain parts of the Kulu valley. *Jammu & Kashmir State*—Astore; Baltistan; Sind Forest Division; Gilgit; Gurez; Jelaun, 9,000 ft.; Kishtwar, Chenab valley; Rattu; Telil.

INDIAN SUBSTITUTE : (ii) **Artemisia maritima** Linn. forma rubricaule Badhwar (Compositae)
Vernacular names : Hindi—*Kirmala;* Kashmir—*Murni.*

DISTRIBUTION : A perennial shrubby species found in the western Himalayas from Kashmir to Kumaon, at 7,000—9,000 ft. This is common in several areas of north-western India, such as Kashmir, Kurram, Kagan, Bushaher, Waziristan, etc. But plants growing only in certain areas of Kashmir and Kurram have been found to contain santonin. In these areas santonin-free plants are also found. Badhwar (*Report on Kurram Artemisias from the Santonin Standpoint,* 1934) has observed that in the earlier stage of growth santonin-bearing plants in Kurram have red stems, while santonin-free plants have green stems, and that both turn brown as they grow older. He has called the former, A. *maritima* forma *rubicaule.*

According to Qazilbash, (*Quart. J. Pharm. Pharmacol,* 1948, 21, 333) the Kurram santonica has not been previously reported from any other source. It is confined to the Upper Kurram and the adjoining Afghan territory, and is botanically quite distinct from all the known species of Artemisia. He has named it as *Artemisia kurramensis* Qazilbash (sp. nov.), and it contains a high percentage of santonin and therefore forms a good substitute for the official species.

10. **Astragalus gummifer** Labill. *(Leguminosae)*

TRAGACANTH : Tragacanth is the dried gummy exudation, obtained by incision from this and some other species of *Astragalus* and is known in commerce as Persian tragacanth.

USES : Tragacanth is used in pharmacy as a suspending agent for insoluble powders, etc., or as a binding agent in pills and tablets.

DISTRIBUTION : The plant is not found in India. It is a shrub indigenous to Greece, the Turkish Empire and Persia. Its cultivation may be tried in the Punjab and the western Himalaya in the temperate zone and in Chitral.

INDIAN SUBSTITUTE : **Astragalus strobiliferus** Royle (*Compositae*)
Vernacular names : Persian—*Kon.*

DISTRIBUTION : An undershrub found in the western Himalayas and upper Kurram. It is fairly common at Birmolast in Chitral at

5,500 ft.; *East Punjab*—Spiti, Kangra Dist.; *Jammu and Kashmir State*—Astore; Gudai; Kanum, Kunawar.

11. (a) **Atropa acuminata** Royle ex Lindley
(b) **Atropa belladonna** Linn. } (*Solanaceae*)

Vernacular names : Bengal—*Yebruj;* Bombay—*Girbuti;* Hindi—*Angur shefa;* Kashmir—*Mait brand.*

BELLADONNA HERB : Belladonna herb consists of the leaves or leaves and other aerial parts from any of these plants, or a mixture of both species collected when the plants are in flower.

BELLADONNA ROOT : Belladonna root is the dried root or root and rootstock from any of these plants, or a mixture of both species.

USES : Belladonna herb and Belladonna root are used as anodyne, delirifacient, antigalactagogue; to relieve pain, relax spasm, decrease secretion, for urinary incontinence, night sweats of phthisis, etc.

DISTRIBUTION : (a) *Atropa acuminata* is a perennial herb growing wild in Kashmir at altitudes of 6,000-12,000 ft. Also occurs in the Chamba State; *Chamba State*—Khangu Reserve Forest; *Jammu and Kashmir State*—Badharwah division; Gulmarg; Jagran river banks; Kamraj; Kishenganga valley; Kishtwar; Kunawar, 8,500 ft.; Langet; Lolab valley forests; Muzafferabad; Pir Panjal, 9,000 ft.; Rajwar forests; Sind valley.

(b) *Atropa belladonna* seeds imported from Kew were experimentally cultivated at the Baramula, Darrang and Yarikah nurseries in Kashmir about 3 years back and it is doing well over there. Its cultivation may also be taken up in the Kumaon Hills where it is likely to do well.

12. **Barosma betulina** Thunb. Bartl. and Wendl. (*Rutaceae*)
(B.P. 1932)

BUCHU . Buchu consists of the dried leaves of this plant.

USES : Buchu is used as a diuretic in diseases of the urinary organs.

DISTRIBUTION : The plant is not met with in India. A small shrubby plant indigenous to Cape Colony. Its cultivation may be tried in moist tropical regions of India.

13. **Camellia sinensis** Linn. O. Kuntze (*Theaceae*)

Vernacular names : Hindi—*Cha.*

CAFFEINE : Caffeine is an alkaloid obtained from the dried leaves of this plant, or from certain other plants.

USES : Caffeine is a cerebral, cardiac, vasomotor and respiratory stimulant and diuretic.

DISTRIBUTION : A shrub or small tree now extensively grown in Assam, Bengal, Sikkim, N.-W. Himalaya and Nilgiris etc.; *Assam*—Abor Hills; Golaghat, Sibsagar Dist.; Jarain, Khasi and Jaintia Hills; Khasi Hills; Khonoma, Naga Hills Dist.; Makum, Lakhimpur Dist.; Nerhema, Naga Hills Dist.; Periphema, Naga Hills Dist.; Shillong, Khasi and Jaintia Hills; *Bihar*—Parasnath Hill, Hazaribagh Dist.; *East Punjab*—Bowarnah, Kangra Dist.; Holta, Kangra Dist.; Nagrawta, Kangra Dist.; Purwain, Hoshiarpur Dist.; *Sikkim State*—Sikkim; *Travancore State*—Cardamom Hills; *Uttar Pradesh*—Phurtpoor, Kumaon; Guddowli, Garhwal Dist.; Hawalbaugh, Kumaon; Kaluwala, Dehra Dun Dist.; Kaolagir, Dehra Dun Dist.; Kuppeena, Kumaon; Kutyoor, Kumaon; Lutchmesir, Kumaon; Paorie village, Kumaon; Raipur, Dehra Dun Dist.; *West Bengal*—Pashak Estate, Darjeeling Dist.

14. **Capsicum minimum** Roxb. (*Solanaceae*)

Vernacular names : Bengal—*Lanka morich;* Hindi—*Gach marich;* Tamil—*Peymilagay.*

CAPSICUM : Capsicum consists of the dried ripe fruits of this plant.

USES : Capsicum is used as a condiment. It is given internally in atonic dyspepsia and flatulence. It is used externally as a counter-irritant.

DISTRIBUTION : A small erect shrub commonly cultivated in many parts of India, principally in the Southern Districts. In South India, Bombay and Bengal, it is often grown on borders of fields and in gardens.

15. **Carum carvi** Linn. (*Umbelliferae*)

Vernacular names : Bengal—*Jira;* Bombay—*Vilayati zirah;* Hindi—*Zira;* Tamil—*Simaishembu.*

CARAWAY : Caraway consists of the dried ripe fruits of the plant.

USES : Caraway is used as a carminative and for flavouring.

DISTRIBUTION : A herb cultivated for its seeds, as a cold weather crop on the plains of India, and frequently on the hills as a summer crop, as in Baltistan, Kashmir, Kumaon and Garhwal, etc., at altitudes of 4,000-12,000 ft.; *East Punjab*—Losar (13,000 ft.), Spiti, Kangra Dist.; Pulga (7,500 ft.), Parbatti valley, Kangra Dist.; *Jammu and Kashmir State*—Astore; Baltal, Sind valley; Bhaghbanpura; Darawa, Gurez; Matayan, Dras valley, Baltistan; Nimu (14,500 ft.), Ladakh; Skardu; Sonmarg (8,000-9,000 ft.), Sind valley; *Uttar Pradesh*—Derali to Jhala (8,000-9,000 ft.), Ganges valley, Tehri Garhwal; Ganges valley, Tehri Garhwal; Jangla (9,000-10,000 ft.), Ganges valley, Tehri Garhwal; Kuthi Yankti valley (12,000-13,000 ft.), Almora Dist.; *West Bengal*—Darjeeling.

16. (a) **Cassia acutifolia** Delile. } (*Leguminosae*)
(b) **Cassia angustifolia** Vahl }

Vernacular names : Bengal—*Sonpat;* Hindi—*Hindi sana;* Tamil—*Nila virai.*

SENNA LEAF, SENNA FRUIT : The dried leaflets of these two plants are known as 'Senna Leaf' and the dried ripe fruits are known as 'Senna Fruit.' In commerce, the leaflets and fruits of *C. acutifolia* are known as 'Alexandrian Senna' and 'Alexandrian Senna Pods,' while the leaflets and fruits of *C. angustifolia* are known as 'Tinnevelly Senna' and 'Tinnevelly Senna Pods.'

USES : Senna Leaf and Fruit are useful purgatives.

DISTRIBUTION : (a) *Cassia acutifolia* is not found in India. It is indigenous to and to some extent cultivated in the regions of the middle and upper Nile. Its cultivation may be tried in the Western Himalayas in a place like Baramula.

(b) *Cassia angustifolia* is largely cultivated in the Madras State especially in Tinnevelly and in the Bombay State, *Bombay*—Ganeshkhind near Poona; *Madras State*—Madura Dist.; Tinnevelly.

17. **Cassia fistula** Linn. (*Leguminosae*)
(B.P. 1932)

Vernacular names : Bengal—*Sonali;* Hindi—*Amaltas;* Tamil—*Aragoram.*

CASSIA PULP : The pulp is dissolved from the crushed fruit by percolation with water. The percolate is strained and evaporated to a soft extract which is known as 'Cassia Pulp.'

USES : Cassia Pulp is a laxative.

DISTRIBUTION : A moderate-sized tree common throughout India ascending to an altitude of 4,000 ft. Very common on the lower mountainous tracts skirting the Himalaya, and extending through Chota Nagpur and Central India to Bombay; *Assam*—Kamrup Dist., Lower Hills; Khasi and Jaintia Hills; Sibsagar; Sylhet; *Baroda*—Baroda; *Bihar*—Manbhum Dist.; Santal Parganas; *Bombay State*—Badami, Bijapur Dist.; Poona Hills; *East Punjab*—Gurdaspur Dist.; Hoshiarpur; *Jammu and Kashmir State*—Jammu; Mirpur; Nowshera (2,000 ft.); Reasi; Udhampur; *Madhya Bharat*—Guna, Isagarh Dist.; *Madhya Pradesh*—Jubbulpore; *Madras State*—Burliar (3,000 ft.), Nilgiri District; Coimbatore Dist.; Kotagiri, Nilgiri Dist.; Shembaganur, Madura Dist.; Shevaroy Hills; Salem Dist.; *Orissa*—Ganjam Dist.; *Rajputana*—Abu, Sirohi State; Ajmer; *Uttar Pradesh*—Adnala range (2,000 ft.), Garhwal Dist.; Chandbagh, Dehra Dun Dist.; Chauk, Gorakhpur Dist.; Chhakhata range, Naini Tal Dist.; Dehra Dun (2,200 ft.); Haldwani, Naini Tal Dist.; Jaspur range (2,000 ft.), Naini Tal Dist.; Kaladhungi, Naini Tal Dist.; Kalsi, Dehra Dun Dist.; Lansdowne, Garhwal Dist.; Naini Tal; Phandowala, Dehra Dun Dist.; Panigang, Gonda Dist.; *West Bengal*—Agartala (600-1,000 ft.), Tripura State; Chandernagore near Calcutta; Great Rangit valley, Darjeeling; Pankhabari (2,000 ft.), Darjeeling; Sibpur near Calcutta.

18. (a) **Cephaelis acuminata** Karsten
(b) **C. ipecacuanha** (Brot.) A. Rich. } (*Rubiaceae*)

IPECACUANHA : Ipecacuanha is the dried root or the rhizome and root from any of these plants.

USES : Ipecacuanha is used as an expectorant and emetic and in the treatment of amoebic dysentry.

DISTRIBUTION : (a) *Cephaelis acuminata* is not found in India.
(b) *Cephaelis ipecacuanha,* a small shrub, is cultivated at Mungpoo near Darjeeling and in the Nilgiris; *West Bengal*—Mungpoo, Darjeeling Dist.

19. **Chenopodium ambrosioides** Linn. var. anthelminticum Gray. (*Chenopodiaceae*)

OIL OF CHENOPODIUM: Oil of Chenopodium is the oil distilled with steam from the fresh flowering and fruiting plants, excluding roots of the plant.

USES: It is a valuable anthelmintic.

DISTRIBUTION: The plant has been cultivated to a small extent in Bengal and Bangalore, but did not prove to be a commercial success.

INDIAN SUBSTITUTE: **Chenopodium album** Linn. (*Chenopodiaceae*)

Vernacular names: Bengal—*Bathusag;* Bombay—*Chakwit;* Hindi—*Bathusag;* Tamil—*Parupukkirai.*

DISTRIBUTION: A herb met with in tropical and temperate Himalayas from Kashmir to Sikkim ascending to 12,000 ft., wild and cultivated, and in western Tibet to 14,000 ft. Also met with in the plains of Bengal, the Gangetic valley and the Punjab, Khasia mountains and the Deccan Peninsula. It occurs chiefly in cultivated ground and is also cultivated as a pot-herb; *Assam*—Dibrugarh; Dhubri; Goalpara; Jaboocka, Naga Hills; Kohima to Nerhema; Makum; Mina station (3,000 ft.), Naga Hills; Naga Hills; Rotung (1,000 ft.), Abor; Shillong, Khasi Hills; Soobhan river on banks; Udalguri; *Bihar*—Pukhuria, Manbhum; *Bombay State*—Dharwar, Kathiawar; *Delhi*—Delhi; *East Punjab*—Amritsar; Losar (13,000 ft.), Spiti, Kangra Dist.; Simla (7,000 ft.); *Jammu and Kashmir State*—Dras valley, Baltistan; *Madras State*—Madras; Malabar; Shembaganur, Madura Dist.; *Rajputana*—Merwara; *Uttar Pradesh*—Allahabad; Balrampur, Gonda Dist.; Banda; Dudhwa range, Kheri Dist.; Etawah; Ganges valley between Betwari and Dangula (6,000-7,000 ft.), Tehri Garhwal; Gola, Kheri Dist.; Lachiwala, Dehra Dun Dist.; Mohan Pass, Siwaliks; Mussoorie; Naini Tal; Saharanpur; Sukhi block, Chakrata range; Tirkunya, Gorakhpur Dist.; *West Bengal*—Dhaneora, Manikgunj; Jalpaiguri; Nawabgunj; Sibpur.

20. (a) **Cinchona calisaya** Weddell
(b) **Cinchona ledgeriana** Moens
(c) **Cinchona officinalis** Linn.
(d) **Cinchona succirubra** Pavon
(B.P. 1932)

(*Rubiaceae*)

Vernacular names : Bengal—*Quinine Gach.*

CINCHONA : Cinchona is the dried bark of these cultivated trees or of hybrids of either of the last two species with either of the first two.

USES : It is used as a simple bitter, tonic, antimalarial and anti-pyretic, usually in the form of its preparations or alkaloids.

DISTRIBUTION : (a) *Cinchona calisaya* : A tree which may be said to have succeeded well under Indian climatic conditions and is largely cultivated in Sikkim at an elavation of 1,500-3,000 ft. above sea-level.

(b) *Cinchona ledgeriana* : A tree which is largely cultivated in the Government of Bengal plantations and flourishes well at the lower elevations of Wynaad at 3,000 ft. in South India. It is one of the species in Bengal and Naduvattam plantations. The cultivation is being developed in all the Indian plantations and is gradually replacing *C. succirubra.*

(c) *Cinchona officinalis*: A tree which is cultivated in South India in the Nilgiris near Ootacamund and thrives at higher altitudes (between 6,000-8,500 ft. above sea-level) better than any other species. The cultivation of this plant has been practically abandoned in Sikkim, as the climate is found to be too moist.

(d) *Cinchona succirubra* : A tree largely cultivated on the Nilgiris and Naduvattam plantations and other hills of South India at altitudes of 3,000-6,000 ft. At higher altitudes the growth is too small to make its cultivation profitable. Also cultivated at the Rangbi and Poomong plantations in Sikkim and Government plantations at Mungpoo near Darjeeling.

21. **Cinnamomum camphora** Nees and Eberm.*(Lauraceae)*

Vernacular names : Bengal—*Karpur;* Hindi—*Kapur;* Tamil—*Karppuram.*

CAMPHOR : Camphor is a white crystalline substance, obtained from the wood of the plant, and purified by sublimation.

USES : Camphor is used externally as a rubefacient, and internally as a mild antiseptic and carminative. It is also employed as a cardiac stimulant by injection particularly in pneumonia.

DISTRIBUTION : A tree cultivated in several parts of India but the Indian plant contains lesser quantity of camphor; *Assam*—Murkong Selek, Sadiya Frontier Tract; Mylliem, Khasi and Jaintia Hills; Shillong (5,000 ft.); *Madras State*—Nilgiri Hills; *Mysore State*—Mysore; *Uttar Pradesh*—Dehra Dun, Forest School Garden; Kandhauli gardens, Dehra Dun; Saharanpur; *West Bengal*—Sibpur Royal Botanic Gardens, Calcutta.

22. **Cinnamomum zeylanicum** Nees (*Lauraceae*)

Vernacular names : Bengal—*Dalchini;* Bombay—*Dalchini;* Hindi—*Dalchini;* Tamil—*Ilavangam.*

CINNAMON : Cinnamon is the dried inner bark of the shoots of coppiced trees, and is known in commerce as Ceylon cinnamon.

USES : Cinnamon is used as a flavouring agent and mild astringent.

DISTRIBUTION : A tree found wild in western and southern India from the Konkan southwards, rising on the slopes of the ghats to 6,000 ft. in altitude. It is common in all the evergreen forests of N. Kanara, very abundant in the Kumta and Siddapur Talukas. It is occasionally cultivated as an ornamental bush in Bombay, Madras and Bengal; *Assam*—Disoi Reserve, Sibsagar; Laulyngkot forests, Khasi and Jaintia Hills; Mahadek forests, Khasi and Jaintia Hills; Mawsynramo (4,500 ft.), Khasi and Jaintia Hills; Nartiang, Khasi and Jaintia Hills; *Bombay State*—Devimane, North Kanara Dist.; *Madras State*—Barliar, Nilgiris; Coimbatore Dist.; Hebri, South Kanara Dist.; Malabar Dist.; Sispara, Nilgiri Dist.; *Mysore State*—Bagadi; Perambadi; *Travancore State*—Kolattu puzha; Quilon; *Uttar Pradesh*—Dehra Dun; *West Bengal*—Sibpur near Calcutta.

23. **Citrullus colocynthis** Schrad. (*Cucurbitaceae*)

Vernacular names : Bengal—*Makhal;* Bombay—*Indrayan;* Hindi—*Indrayan;* Tamil—*Peykumutti.*

COLOCYNTH : Colocynth is the dried pulp of the fruit of the plant.

USES : Colocynth is a powerful hydragogue cathartic.

DISRTIBUTION : A perennial herb found wild in waste lands almost throughout India, particularly in the north-west, central and south India; *Bombay State*—Ahmadabad; *Delhi*—Delhi; *East Punjab*—Jullundur; Kumharsam, Simla Hills; *Madhya Pradesh*—Chanda; *Madras State*—Bodinayakanur, Madura Dist.; Bukkapatnam (3,000 ft.), Anantapur Dist.; Madras; Nandavaram, Nellore Dist.; Ramaypatnam, Nellore Dist.; Tirakkurungudi, Tinnevelly Dist.; *Rajputana*—Merwara; *Travancore State*—Trivandrum; *Uttar Pradesh*—Saharanpur garden; *West Bengal*—Sibpur near Calcutta.

24. **Citrus aurantium** Linn. (*Rutaceae*)

Vernacular names : Bengal—*Kamla nembu;* Bombay—*Narangi;* Hindi—*Sangtara;* Tamil—*Narangam.*

FRESH BITTER ORANGE PEEL : Fresh Bitter Orange Peel is the fresh outer part of the pericarp of the ripe, or nearly ripe, fruit of the plant.

DRIED BITTER ORANGE PEEL : Dried Bitter Orange Peel is the dried outer part of the pericarp of the ripe, or nearly ripe, fruit of the plant.

USES : Bitter Orange Peel is used as a flavouring agent and as a bitter tonic.

DISRTIBUTION : It is a small tree widely cultivated in different parts of India. Said to be indigenous in the Mothronwala Swamp, Dehra Dun, Garhwal, Kumaon, Sikkim, Khasia Hills, Manipur, mountain forests of the Peninsula. It is cultivated in Assam, Madras, Mysore and Bombay. In Madras its cultivation is largely centred in the districts of Guntur.

25. **Citrus limon** Burm. (*Rutaceae*)

FRESH LEMON PEEL, DRIED LEMON PEEL : Fresh Lemon Peel is the outer part of the fresh pericarp of the ripe, or nearly ripe, fruit of the plant. Dried Lemon Peel is the dried outer part of the pericarp of the ripe, or nearly ripe, fruit of the plant.

USES : Lemon Peel is used as a flavouring agent, stimulant and aromatic.

INDIAN SUBSTITUTE : **Citrus medica** Linn. var. Limonum Linn. (*Rutaceae*)

Vernacular names : Bengal—*Bara nebu;* Hindi—*Bara nimbu;* Punjab—*Gulgul;* Tamil—*Madulam.*

DISRTIBUTION : This plant is considered to be the same as the above-mentioned plant *Citrus limon* Burm. The plant is cultivated mainly in home gardens and in small sized orchards. It is grown on a small scale in the U.P., Bombay, Mysore and Madras. Lemon is reported to be found wild in Almora.

26. **Claviceps purpurea** Tulasne (*Hypocreaceae*)

ERGOT : Ergot is the sclerotium of a fungus, *Claviceps purpurea* arising in the ovary of the rye, *Secale cereale*.

USES : Ergot is used in labour to assist delivery and to reduce post-partum haemorrhage.

DISRTIBUTION : It is cultivated to a small extent in the Nilgiris in South India.

Ergot has been reported wild on some grasses in Simla Hills, but samples of wild ergot found on the grasses *Brachypodium sylvaticum* Beauv., *Oplismenus compositus* Beauv., and *Chrysopogon* species obtained from the Simla Hills showed no alkaloid.

27. **Colchicum autumnale** Linn. (*Liliaceae*)

COLCHICUM CORM, COLCHICUM SEED : Colchicum Corm is the fresh corm of the plant, collected in the early summer; or the same deprived of its coats, sliced transversely, and dried at a temperature not exceeding 65°. Colchicum Seed consists of the dried ripe seed of the plant.

USES : Colchicum Corm and Colchicum Seed are used to relieve gout.

DISRTIBUTION : The plant is not met with in India. A herbaceous plant widely distributed over central and southern Europe and common in parts of England. Its cultivation should be tried in the western temperate Himalayas from Kashmir to Chamba at altitudes of 2,000-9,000 ft.

INDIAN SUBSTITUTE : **Colchicum luteum** Baker (*Liliaceae*)

Vernacular names : Hindi—*Hirantutiya;* Urdu—*Suranjane talkh.*

DISTRIBUTION : An annual herbaceous plant which occurs extensively in the

western temperate Himalayas from Kashmir to Chamba at altitudes of 2,000-9,000 ft., usually in open grassy places. It grows abundantly near Srinagar and road sides from Garhi to Baramula; *Jammu and Kashmir State*—Badharwah; Baramula; Chenab valley (8,000 ft.); Domel; Garhi; Gulmarg (8,500 ft.); Kishtwar; Sonemarg (8,000 ft.), Sind valley; Srinagar.

28. **Commiphora molmol** Engl. (*Burseraceae*)

MYRRH : Myrrh is an oleo-gum resin, obtained from the stem of this species and possibly other species of *Commiphora.*

USES : Myrrh is used in incense and perfumes. It is a local stimulant and antiseptic. It is chiefly employed in medicine in the form of a mouth wash.

DISRTIBUTION : The plant is not met with in India. These are shrubs or small trees growing in North Eastern Africa and Southern Arabia. Its cultivation may be tried in the warmer parts of India like Rajputana Desert, Bellary, Mysore, Deccan, Khandesh, Kathiawar, Sind, Baluchistan.

29. **Copaifera** species (*Leguminosae*)
(B.P. 1932)

COPAIBA : Copaiba is an oleo-resin obtained by incision from the trunks of various species of *Copaifera* Linn.

USES : It is a stimulant, antiseptic, diuretic and is used in chronic inflammation of the genito-urinary tract and in chronic bronchitis.

DISRTIBUTION : The plant is not met with in India. Large trees indigenous to Brazil and north of South America. Its cultivation may be tried in the tropical rain forests of Bengal.

30. **Coriandrum sativum** Linn. (*Umbelliferae*)
Vernacular names : Bengal—*Dhane;* Bombay—*Dhanya;* Hindi—*Dhania;* Tamil—*Kotamalli.*

CORIANDER, OIL OF CORIANDER : Coriander consists of the dried ripe fruits of the plant. Oil of Coriander is the oil distilled from Coriander.

USES : Coriander and Oil of Coriander are aromatic, carminative and stimulant. These are added to purgative medicines to diminish the tendency to griping.

DISRTIBUTION : An annual herb widely cultivated all over India.

31. (a) **Datura stramonium** Linn.
(b) **Datura tatula** Linn. } (*Solanaceae*)

Vernacular names : Bengal—*Sada dhutura;* Sanskrit—*Dhattura;* Tamil—*Umattaka.*

STRAMONIUM : Stramonium consists of the dried leaves and flowering tops of these plants.

USES : Stramonium is used in the treatment of asthma.

DISRTIBUTION : (a) *Datura stramonium* : A bushy annual abundantly found throughout the temperate Himalayas from Kashmir to Sikkim. It is distributed east and west along the outer Himalayas covering a region of over 1,000 miles. Abundant around Simla, met with everywhere on the march north to upper Kulu, frequent on roadsides or village sites. Particularly plentiful for miles of country, in the deep valley of Sutlej as at Rampur. Also met with in the hilly tracts of central and southern India; *Assam*—Khasi Hills (5,000 ft.); Nowgong; Shillong (5,500 ft.); *Bihar*—Ranchi ghats; *East Punjab*—Alwas (5,000—7,000 ft.), Chamba State; Chini, Bashahr State; Simla; Tisa, Chamba State; *Rajputana*—Beawar, Ajmer Merwara; *Uttar Pradesh*—Almora (5,000—6,000) ft.); Nainital; Ranikhet (5,000—6,000 ft.), Almora Dist.; *West Bengal*—Kalimpong (4,000 ft.), Darjeeling Dist.

(b) *Datura tatula* Linn. is similar to *Datura stramonium* Linn. but the stem is usually tinged purple. Its distribution in India is same as of *Datura stramonium,* though it is not so common as *D. stramonium.* It is more common in Afghanistan.

32. **Digitalis purpurea** Linn. (*Scrophulariaceae*)

DIGITALIS LEAF : Digitalis Leaf consists of the dried leaves of the plant, rapidly dried at a temperature between 55° and 60° as soon as possible after collection.

USES : Digitalis Leaf is used as a cardiac stimulant and tonic and as a diuretic.

DISRTIBUTION : A biennial herb grown in gardens in different hill stations for ornamental purposes and cultivated in Kashmir, Darjeeling, Nilgiri hills, etc., on a commercial scale for medicinal purposes. It is said to have lately run wild in the Nilgiris. *Jammu & Kashmir State*—Kairu forests, Tangmarg (7,000 ft.); Yarikah. Tangmarg; *Madras State*—Kodaikanal (7,000 ft.), Madura Dist.; Ootacamund, Nilgiri Dist. (an escape); *Uttar Pradesh*—Ranikhet (6,000 ft.), Almora Dist.; *West Bengal*—Darjeeling.

33. **Dryopteris filix-mas** (Linn.) Schott (*Polypodiaceae*)

MALE FERN : Male Fern consists of the rhizome and leaf-bases of the plant, collected late in the autumn, divested of the roots and dead portions and carefully dried, and is used within one year from the time of collection.

USES : Male Fern is used as a taenicide.

DISRTIBUTION : A perennial fern found in the Himalayas at altitudes of 6,000-9,000 ft., from Bhutan to Kumaon. Also in Khasia at altitude of 5,000 ft. and in South India on the western mountains at altitudes of 4,000-6,000 ft. Common in Sikkim.

Dryopteris odontoloma (Moore) C. Chr. and *D. marginata* (Wall.) Christ, belonging to *Dryopteris* (Lastrea) *filixmas*, a complex group of ferns grow wild in the mountains of Jammu and Kashmir as common forest undergrowth at altitudes of 6,000-10,000 ft. Samples of these on analysis show that these ferns can be used as a substitute for the official Male Fern. *D. blandforii* (Hope) C. Chr. which occurs near Kalatope and Chhatri near Chamba also contains an anthelmintic active principle and comes up to the standard laid down in the British Pharmacopoeia.

34. **Elettaria cardamomum** Maton var. Minuscula Burkill. (*Zingiberaceae*)

Vernacular names : Bengal—*Elachi;* Bombay—*Ilachi;* Hindi—*Chhoti elachi;* Tamil—*Ilanji.*

CARDAMOM : Cardamom consists of the dried ripe, or nearly ripe, seeds of the plant.

USES : Cardamom is used as a flavouring agent and has carminative properties.

DISRTIBUTION : A large perennial herb which is indigenous in west and south India, growing abundantly in the rich moist forests of the hilly tracts of Kanara, Mysore, Coorg, Wynaad, Travancore and Cochin; *Bombay State*—North Kanara hilly tracts; *Cochin State*—Cochin; *Coorg*—Coorg, South India; *Madras State*—Calicut, Malabar Dist.; Chirakkal, Malabar Dist.; Cundapur, South Kanara Dist.; Dindigul, Madura Dist.; Ernad, Malabar Dist.; Kanni Katti, Tinnevelly Dist.; Kasaragod, South Kanara Dist.; Kodaikanal, Madura Dist.; Kottayam, Malabar Dist.; Kurumbranal, Malabar Dist.; Mangalore, South Kanara Dist.; Ootacamund, Nilgiri Dist.; Palni, Madura Dist.; Periyakulam, Madura Dist.; Upinagadi, South Kanara Dist.; Wynaad, Malabar Dist.; Yercaud, Shevaroy Hills, Salem Dist.; *Mysore State*—Kadur Dist.

35. **Ephedra equisetina** Bunge
Ephedra sinica Stapf } (*Gnetaceae*)

EPHEDRINE HYDROCHLORIDE : Ephedrine Hydrochloride is the drug prepared from ephedrine, an alkaloid, obtained from these and other species of *Ephedra*.

USES : Ephedrine Hydrochloride is used as a vasoconstrictor, mydriatic, and stimulant to the sympathetic nervous system; in bronchial asthma, hay fever, catarrh, haemorrhage, etc.

DISTRIBUTION : These plants are not met with in India. These are herbaceous plants indigenous to China. Their cultivation may be tried in the drier regions of temperate and sub-alpine Himalayas from 7,000-15,000 ft.

INDIAN SUBSTITUTE : **Ephebra gerardisna** Wall. (including E. nebrodensis Tineo)
(*Gnetaceae*)
Vernacular names : Jaunsar—*Tutgantha;* Punjab—*Asmania.*

DISTRIBUTION : A low growing rigid tufted shrub abundant in the drier regions of temperate and alpine Himalayas at altitudes of 7,000-14,000 ft., and in Western Tibet to Sikkim at altitudes of 12,000 ft. to 16,000 ft.; *East Punjab*—Bara Lacha, Kangra Dist.; Lahul, Kangra Dist.; Lichu (14,000 ft.), Spiti, Kangra Dist.; Pangi, Chamba State; Shali (10,000 ft.), Bhajji State,

Simla Dist.; Spiti (14,000 ft.), Kangra Dist.; *Jammu and Kashmir State*—Badogam near Tilel (12,000-14,000 ft.), Kishenganga valley; Baltal (10,000-11,000 ft.), Sind valley; Baltistan, West of Dras (11,000-12,000 ft.); Jhelum valley (7,800-11,200 ft.); Kungi La to Ringdom (12,000 ft.), Zaskar; Ladakh (15,000 ft.); Lamayuru (12,000 ft.), Ladakh; Leh, Ladakh; Naltar valley (11,000-12,000 ft.), north of Gilgit; Rupshu (19,000 ft.); Sonmarg (11,000 ft.), Sind valley; Takht-i-Sulaiman, Srinagar; Tatha Mula, Muzaffarabad, Jhelum valley; *Sikkim State*—Sikkim (12,750-15,600 ft.); *Uttar Pradesh*—Badrinath (9,150-12,000 ft.), Garhwal Dist.; Chalek (10,050-10,950 ft.), Almora Dist.; Deoban-Mundali road (9,000 ft.), Jaunsar; Dhauli valley (on rocks, 10,050-10,950 ft.), Kumaon; Gangotri (12,000-13,000 ft.), Tehri Garhwal; Kuthi valley (11,000-12,000 ft.), Kumaon; Malari valley, Garhwal; Milam (9,000-16,000 ft.), Gori valley, Almora Dist.; Nili valley, Garhwal; Nipchang valley in Darma (11,000-13,000 ft.), Kumaon; Pindari (9,000-16,000 ft.), Almora Dist.; Suki, Bhagirathi Ganges, Garhwal.

36. **Erythroxylum coca** Lam. (*Erythroxylaceae*)

Vernacular names : Tamil—*Sivadari*.

COCAINE : Cocaine is an alkaloid, obtained from the leaves of this plant and other species of *Erythroxylum*.

USES : Cocaine is used as a local anaesthetic.

DISTRIBUTION : A shrub 2-6 ft. high which is grown only as a garden plant in India. The Indian grown plant has no alkaloid; *Assam*—Amguri, Nowgong Dist.; *Baroda*—Baroda College Botanical garden, Baroda; *Bombay State*—Bombay Victoria gardens; *Madras State*—Nilgiris (3,000 ft.); *West Bengal*—Sibpur, Royal Botanic garden, near Calcutta.

37. **Eucalyptus species** (*Myrtaceae*)

OIL OF EUCALYPTUS : Oil of Eucalyptus is the oil distilled from the fresh leaves of various species of *Eucalyptus* and rectified.

USES : Oil of Eucalyptus is employed as an antiseptic and deodorant.

INDIAN SUBSTITUTE : **Eucalyptus globulus** Labill. (*Myrtaceae*)

Vernacular names : Tamil—*Karupuramaram*.

DISTRIBUTION : A lofty tree, an introduced plant, which has met with complete success in the Nilgiris where it has become completely naturalized. Also cultivated at Ranikhet and Shillong; *Assam*—Shillong (2,000 ft.), Khasi and Jantia Hills; *East Punjab*—Kulu, Kangra Dist.; *Madras State*—Armby near Ootacamund, Nilgiri Dist.; Arnikal near Ootacamund, Nilgiri Dist.; Baike near Ootacamund, Nilgiri Dist.; Cally near Ootacamund, Nilgiri Dist.; Kotagiri, Nilgiri Dist.; Norwood near Ootacamund, Nilgiri Dist.; Ootacamund, Nilgiri Dist.; *Uttar Pradesh*—Dalmoti (5,500 ft.); Dehra Dun (Chandbagh); Pithorgarh, Almora Dist.; Ranikhet, Almora Dist.; Saharanpur Botanical Garden; *West Bengal*—Rangbi Tea Estate, Darjeeling Dist.; Rangyrum Estate, Darjeeling Dist.

38. **Eucarya spicata** Sprague and Summerhayes (*Santalaceae*) (B.P. 1932)

OIL OF AUSTRALIAN SANDAL WOOD : Oil of Australian Sandal Wood is the oil distilled from the wood of this plant and rectified.

USES : Oil of Australian Sandal Wood is used in perfumery. It is also employed as disinfectant for the urinogenital tract and as expectorant in bronchitis.

DISTRIBUTION : The plant is not met with in India. A large bush found in West Australia. Its cultivation may be tried in the dry, open regions of south India.

39. **Eugenia caryophyllus** (Spreng.) Sprague. (*Myrtaceae*)

Vernacular names : Bengal—*Lavanga*; Hindi—Laung.

CLOVE, OIL OF CLOVE : Clove consists of the dried flower-buds of this plant. Oil of Clove is the oil distilled from Clove.

USES : Cloves are used as a stimulant aromatic. Oil of Clove is used as a flavouring agent, stimulant, aromatic and antiseptic.

DISTRIBUTION : A tree which has been introduced and cultivated in south India, in Government gardens, Burliar and in Central Travancore; *Travancore State*—Koni.

40. **Ferula foetida** Regel
Ferula rubricaulis Boiss (B.P. 1932) *(Umbelliferae)*

Vernacular names : Bengal—*Hing;* Bombay—*Hing;* Hindi—*Hing;* Tamil—*Perungayam.*

ASAFETIDA : Asafetida is an oleo-gum-resin, obtained by incision from the living rhizome and root of these plants or other species of *Ferula.*

USES : Asafetida is used in hysterical conditions, as an expectorant in chronic bronchitis and as a means of removing intestinal flatulence. Large quantities are used in veterinary work.

DISTRIBUTION : These plants grow wild in the sandy deserts and dry arid hills of eastern Persia, Khorasan, Kandahar and Afghanistan.

INDIAN SUBSTITUTE : **Ferula narthex** Boiss *(Umbelliferae)*

Vernacular names : Bengal—*Hing;* Bombay—*Hing;* Hindi—*Hing;* Tamil—*Perungayam.*

DISTRIBUTION : A perennial herb grows abundantly in the villages of Kashmir in Baltistan and Astore and in Western Tibet; *Jammu and Kashmir State*—Astore; Baltistan; Gudhai, Astore; Kishtwar, Chenab valley.

41. **Foeniculum vulgare** Mill. *(Umbelliferae)*

Vernacular names : Bengal—*Mauri;* Bombay—*Panmohuri;* Hindi—*Saunf;* Tamil—*Sohikirai.*

FENNEL : Fennel consists of the dried ripe fruits of this plant obtained from cultivated plants.

USES : Fennel is used as an aromatic and carminative.

DISTRIBUTION : A herb commonly cultivated all over India at all altitudes up to 6,000 ft., but is sometimes also found wild and as an escape.

42. (a) **Gelidium cartilagineum** Gaill.
(b) **Gelidium corneum** (Huds.) Lamouroux *(Gelidiaceae)*

Vernacular names : Bengal—*Chinaghash;* Hindi—*Chinaghash.*

AGAR : Agar is a dried gelatinous substance prepared from these plants.

USES : Agar is used in the treatment of chronic constipation and as an emulsifying agent.

DISTRIBUTION : *Gelidium* species occur on the Indian coasts. *Gelidium corneum* is fairly abundant. These algae are collected chiefly off the coast of Japan.

43. **Gentiana lutea** Linn. (*Gentianaceae*)

GENTIAN : Gentian consists of the dried rhizome and root of this plant.

USES : Gentian is used as a bitter tonic.

DISTRIBUTION : The plant is not met with in India. A herbaceous perennial indigenous to central Europe and Spain. Its cultivation should be tried in the temperate Himalayas at an altitude of 5,000-9,000 ft.

INDIAN SUBSTITUTE : **Picrorhiza kurroa** Royle (*Scrophulariaceae*)

Vernacular names : Bengal—*Katki;* Bombay—*Kali katki;* Hindi—*Kuru;* Tamil—*Katukurogani.*

As the pharmacological activity of gentian depends on the bitter principle contained in it, *Picrorhiza kurroa,* if properly standardized, might be used where bitters are indicated.

DISTRIBUTION : A herb common on the alpine Himalayas from Kashmir to Sikkim at altitudes of 9,000-15,000 ft.; *East Punjab*—Kulu valley (13,000 ft.), Kangra Dist.; Lahul Upper Bhaga valley, (9,000-13,000 ft.), Kangra Dist.; Rohtang Pass, (13,000 ft.), Kulu, Kangra Dist.; Sathraundi (12,000 ft.), Chamba State; *Jammu and Kashmir State*—Burzil Pass (11,000-12,000 ft.); Gurez Pass (12,000 ft.); Kamri Pass, Gurez; Kolahoi (10,000-12,000 ft.); Ladakh; Lidder valley; Pir Panjal (11,000 ft.); Shingo La (15,000 ft.), Zaskar; Tragbal (12,00 ft.); Zojpal (10,000-13,000 ft.); *Uttar Pradesh*—Badrinath (10,000-12,000 ft.), Garhwal Dist.; Jhalla (11,000-12,000 ft.), Ganges valley, Tehri Garhwal; Kidarkanta (10,000-11,000 ft.), Tehri Garhwal; Kuari Pass (11,000-12,000 ft.), Garhwal; Mussoorie; Palangadh, Byans, Almora Dist.; Ralam valley, Kumaon.

44. **Glycyrrhiza glabra** Linn. (*Leguminosae*)

Vernacular names : Bengal—*Jashti madhu;* Bombay—*Jashtimadhu;* Hindi—*Mulathi;* Tamil—*Atimaduram.*

LIQUORICE : Liquorice consists of the roots and subterranean stems of this plant and other species of *Glycyrrhiza.*

USES : Liquorice is employed as a demulcent, mild expectorant and as a flavouring agent.

DISTRIBUTION : A perennial herb met with in the sub-Himalayan tracts. Rooted suckers of this plant procured from the Professor of Botany, Agricultural College, Lyallpur, for experimental cultivation in the Kashmir State, are doing quite well at the Baramula nursery.

45. **Gossypium** Sp. (*Malvaceae*)

Vernacular names : Bengal—*Kapas;* Bombay—*Kapas;* Hindi—*Rui;* Tamil—*Parutti.*

COTTONSEED OIL : Cottonseed Oil is the fixed oil, obtained from the seeds of various cultivated species of Gossypium.

USES : Cottonseed Oil is an emollient and nutrient.

DISTRIBUTION : These plants are widely cultivated more or less in every State in India.

46. **Hamamelis virginiana** Linn. (*Hamamelidaceae*)

HAMAMELIS : Hamamelis consists of the dried leaves of this plant.

USES : Hamamelis is used as an astringent and haemostatic.

DISTRIBUTION : The plant is not met with in India. A shrub indigenous to the United States and Canada. Its cultivation may be tried in the temperate Himalayas.

47. **Hordeum distichon** Linn. (*Gramineae*)

EXTRACT OF MALT : Extract of Malt is prepared from sound, malted grain of this plant.

USES : Extract of Malt is nutritive and laxative.

DISTRIBUTION : This herbaceous plant is largely cultivated in several parts of India.

48. **Hydnocarpus wightiana** Blume (*Bixaceae*)

Vernacular names : Bengal—*Chaulmugra;* Bombay—*Kauti;* Sanskrit—*Garudaphala;* Tamil—*Maravetti.*

HYDNOCARPUS OIL : Hydnocarpus Oil is the fatty oil, obtained by cold expression from the fresh, ripe seeds of this plant.

USES : Hydnocarpus Oil is used in the treatment of leprosy.

DISTRIBUTION : A large evergreen tree endemic in tropical forests along the western ghats from the Konkan southwards and below the ghats in Kanara and Malabar in damp situations, especially near water. Common in Travancore up to 2,000 ft.; *Bombay State*—Bombay; Sulgiri, North Kanara Dist.; *Cochin State*—Cochin; *Madras State*—Dhoni, South Malabar Dist.; Shembaganur, Madura Dist.; Ulandipore (2,100 ft.), Anamalai Hills; Walayar, Coimbatore Dist.; *Mysore State*—Mysore; *Travancore State*—Colatoorpolay; Devikolam; Kalattupuzha; Malayanthur; Naduvathumuzhi; Quilon; *Uttar Pradesh*—Dehra Dun Forest Research Institute; *West Bengal*—Sibpur Royal Botanic garden, Calcutta.

49. **Hyoscyamus niger** Linn. (*Solanaceae*)

Vernacular names : Bengal—*Khorasani ajowan;* Bombay—*Khorasani owa;* Hindi—*Khurasani-ajvayan;* Tamil—*Kurasani yomam.*

HYOSCYAMUS : Hyoscyamus consists of the dried leaves and flowering tops of this plant.

USES : Hyoscyamus is used to check vesical spasm in urinary incontinence and is also combined with purgatives to obviate their griping action.

DISTRIBUTION : A herb found wild in the temperate western Himalayas from Kashmir to Garhwal at altitudes of 5,000-11,000 ft.; frequent on waste ground adjoining habitations. It has also been cultivated in Saharanpur, neighbourhood of Agra and Ajmere, in Bombay at Hewra and Dapuri, the Nilgiris and in the Royal Botanic Garden, Calcutta; *East Punjab*—Brahmaur (8,000 ft.), Chamba State; Chiri (9,500 ft.), Bashahr State; Simla Dist.; Kilar (8,500 ft.), Chamba

State; Laj (8,500 ft.), Chamba State; Narkunda, Simla Dist.; Pangi, Chamba State; Po, Spiti, Kangra Dist.; *Jammu and Kashmir State*—Baramula; Darrang; Dras (10,000 ft.); Gulmarg; Kazinag range, Muzaffarabad; Kulgam, Anantnag; Korakaram range; Ladakh; Pahalgam; Sind valley; Shopyan range; Srinagar; Yarikah; *Uttar Pradesh*—Malari (10,000-11,000 ft.), Kumaon; Saharanpur.

INDIAN SUBSTITUTE : **Hyoscyamus muticus** Linn. (*Solanaceae*)
Vernacular names : *Baluchistan—Koheebhang.*

DISTRIBUTION : A herbaceous plant grows in patches along the river banks in the west Punjab, Sind and the North-West Frontier Province. Its cultivation is being tried in Kashmir.

50. **Illicium verum** Hook. f. (*Magnoliaceae*)

OIL OF ANISE : Oil of Anise is the oil distilled from the dried fruits of this plant or from the dried ripe fruits of *Pimpinella anisum* Linn.

USES : Oil of Anise is used as a flavouring agent and carminative.

DISTRIBUTION : The plant is not met with in India. A tree indigenous to the Southern and South-western Provinces of China. Its cultivation may be tried in the Khasia Hills and Bhutan at altitudes of 4,000-5,000 ft.

51. **Ipomoea orizabensis** (Pellet.) Ledanois (*Convolvulaceae*)

IPOMOEA : Ipomoea is the dried root of this plant.

USES : Ipomoea is a hydragogue cathartic.

DISTRIBUTION : The plant is not met with in India. A climbing plant indigenous to the Mexican Andes. Its cultivation may be tried in south India hills and eastern Himalayas from 3,000-6,000 ft.

52. **Ipomoea purga** Hayne (*Convolvulaceae*)
(B.P. 1932)

JALAP : Jalap consists of the dried tubercles of this plant.

USES : Jalap is a powerful hydragogue cathartic.

DISTRIBUTION : An introduced plant which is now cultivated in India and gave good results in Ootacamund gardens in the Nilgiris. Also grown in the N.-W. Himalayas at Mussoorie; *Madras State*—Doddabetta, Nilgiri Hill; Ootacamund, Nilgiri Hill; *Uttar Pradesh*—Mussoorie.

INDIAN SUBSTITUTE : **Ipomoea turpethum** R. Br. (*Convolvulaceae*)
Vernacular names : Bengal—*Dhudkalmi;* Bombay—*Nishotar;* Hindi—*Pitohri;* Tamil—*Kumbam.*

DISTRIBUTION : It is found throughout India ascending to altitudes of 3,000 ft.; occasionally it is cultivated as an ornamental plant in the gardens; *Assam*—Amguri, Nowgong Dist.; Kamrup plains; *Bombay State*—Konkan; North Kanara Dist.; Mumba near Thana; Vasterapur near Ahmadabad; *Bihar*—Chota Nagpur; Karagola, Purnea Dist.; Kolhan, Singhbhum Dist.; Manbhum; Palamau; Longabera, Singhbhum; *Madhya Pradesh*—Gourjhamar, Saugor; Jubbulpore; Narsinghpur forest division; Rahatgarh Reserve, Saugor; Yeotmal; *Coorg*—Coorg; *Madras State*—Adyar; Coimbatore; Malabar; Mount Nilgiri; Pungancheri, Bolampatti valley (1,500 ft.), Coimbatore Dist.; *Orissa*—Angul; *Travancore State*—Variyur; *Uttar Pradesh*—Banda; Doiwala, Dehra Dun; Dudwa, Kheri Dist.; Kheri; Moradabad; *West Bengal*—Hooghly; Sibpur near Calcutta.

53. **Jateorhiza palmata** (Lam.) Miers (*Menispermaceae*)
Vernacular names : Bombay—*Colombo;* Tamil—*Kolumbu.*

CALUMBA : Calumba is the root of this plant, cut into oblique or transverse slices, and dried.

USES : Calumba is used as a bitter tonic.

DISTRIBUTION : A large scandent undershrub of South East Africa which is cultivated in some places in India. Its cultivation was tried in Madras gardens and the Royal Botanic Garden, Calcutta.

54. **Juniperus oxycedrus** Linn. (*Coniferae*)

OIL OF CADE : Oil of Cade is an oily liquid, obtained by the destructive distillation of the woody portions of this plant.

Uses : Oil of Cade is used in skin diseases, such as psoriasis and eczema and for veterinary purposes.

Distribution : The plant is not found in India. A tree common in the Mediterranean districts of Northern Africa, France and Spain. Its cultivation may be tried in the temperate and sub-arctic regions of the Himalayas between 8,000-15,000 ft.

55. **Krameria triandra** Ruiz & Pav. (*Leguminosae*)

Krameria : Krameria is the dried root of this plant.

Uses : Krameria is used as an astringent.

Distribution : The plant is not found in India. A shrubby plant indigenous to the mountain slopes of Peru and Bolivia. Its cultivation may be tried on the mountain slopes of the hills near Darjeeling.

56. **Lavandula officinalis** Chaix (*Labiatae*)

Oil of Lavender : Oil of Lavender is the oil distilled from the fresh flowering tops of the plant.

Uses : Oil of Lavender is used as a stimulant and flavouring agent.

Distribution : The seedlings of this plant were imported and it has been successfully cultivated on a small scale in Kashmir at the Chattarnar and Srinagar nurseries and its cultivation has a promising future over there.

An analysis of the dry flowers from a few cultivated samples gave a high yield of 2.4% of the essential oil.

57. **Liquidamber orientalis** Mill. (*Hamamelidaceae*)

Vernacular names : Bengal—*Silaras;* Hindi—*Silaras.*

Storax : Storax is a balsam obtained from the wounded trunk of this plant, and subsequently purified.

Uses : Storax is chiefly used in the preparation of Friar's Balsam.

Distribution : The plant is not found in India. A tree indigenous to the

south-west of Asiatic Turkey. Its cultivation may be tried in the N.-W. India and the Indus region.

58. **Linum usitatissimum** Linn. (*Linaceae*)
(B.P. 1932)

Vernacular names : Bengal—*Tisi;* Bombay—*Alasi;* Hindi—*Alsi;* Tamil—*Alshi.*

CRUSHED LINSEED, LINSEED, LINSEED OIL : Crushed Linseed is Linseed, coarsely powdered. Linseed consists of the dried ripe seeds of the plant. Linseed Oil is the fixed oil, obtained from Linseed.

USES : Crushed Linseed is used in the form of a poultice. The whole seeds are employed to make demulcent preparations. The oil is used in liniments, paints, the manufacture of linoleum, etc.

DISTRIBUTION : An annual herb cultivated throughout India up to 6,000 ft. in the Himalayas; *Assam*—Gauhati, Kamrup Dist.; Golaghat, Sibsagar Dist.; Luhit valley; Tezpur, Darrang Dist.; *Baroda*—Baroda; *Bihar*—Champaran; Darbhanga; Gaya; Muzaffarpur; Saran; *Bombay State*—Ahmadabad; Bijapur; Dharwar; Khandesh; Nasik; *Madhya Pradesh*—Akola, Berar; Amraoti, Berar; Balaghat; Bhandara; Bilaspur; Buldana, Berar; Chanda; Damoh; Jubbulpore; Nagpur; Raipur; Saugor; Wun, Berar; *East Punjab*—Ambala; Gurdaspur; Hoshiarpur; Kangra; Simla; Spiti, Kangra Dist.; *Sikkim State*—Sikkim; *Uttar Pradesh*—Allahabad; Azamgarh; Banda; Basti; Benares Division; Dehra Dun; Gorakhpur; Hamirpur; Jharosi; Jalaun; Kumaon (1,000-3,000 ft.); Lalitpur; Mirzapur; Moradabad; Saharanpur; *West Bengal*—Agartala (600-800 ft.), Tripura State; Burdwan; Jessore; Murshidabad; Nadia.

59. **Lobelia inflata** Linn. (*Campanulaceae*)
(B.P. 1932)

LOBELIA : Lobelia consists of the dried aerial parts of this plant.

USES : Lobelia is used in spasmodic asthma and chronic bronchitis. In large doses the drug may cause medullary paralysis.

DISTRIBUTION : The plant is not found in India. An annual herb indigenous to and cultivated in the eastern United States of America. Its cultivation may be tried in the Nilgiris and Travancore

between 3,000-7,000 ft. as also in the eastern Himalayas in India.

INDIAN SUBSTITUTE : **Lobelia nicotianifolia** Heyne. (*Campanulaceae*)
Vernacular names : Bengal—*Nala;* Bombay—*Dawal;* Hindi—*Nala;* Tamil—*Kuttuppugaiyilai.*

DISTRIBUTION : An erect herb found in Malabar, on the Ghats from Bombay to Travancore at altitudes of 3,000-7,000 ft.; *Bombay State*—Borghat, Poona Dist.; Castle Rock, North Kanara Dist.; Lunavada (2,000 ft.), Rewa Kantha Agency; Mahabaleshwar, Sitara Dist.; *Coorg*—Mercara; *Madhya Pradesh*—Pachmarhi, Hoshangabad Dist.; *Madras State*—Anaikatti (5,400 ft.), Coimbatore Dist.; Bhoni, Malabar Dist.; Kalakkadu, Tinnevelly Dist.; Kodaikanal, Madura Dist.; Mount Nilgiri; Materikal (4,000 ft.), Tinnevelly Dist.; Nilgiris; Perumal Mundi (5,500 ft.), Coimbatore Dist.; Pulneys; Shembaganur; Wynaad, Malabar; *Travancore State*—Kulthurpuzha, Ponmudi; *Uttar Pradesh*—Chandbagh, Dehra Dun; Dehra Dun Botanical experimental area.

60. **Melaleuca leucadendron** Linn. (*Myrtaceae*)
Vernacular names : Bengal—*Cajuputte;* Bombay—*Kayaputi;* Hindi—*Kayaputi;* Tamil—*Kaiyappudai.*

OIL OF CAJUPUT : Oil of Cajuput is the oil distilled from the fresh leaves and twigs of this plant, and other species of *Melaleuca,* and rectified by steam distillation.

USES : Oil of Cajuput is used externally for rheumatism and certain skin diseases, and internally for flatulent colic, etc.

DISTRIBUTION : A tree sometimes planted in Indian gardens. Its cultivation can be expanded in India.

61. **Mentha piperita** Linn. (*Labiatae*)

OIL OF PEPPERMINT : Oil of Peppermint is the oil distilled from the fresh flowering tops of this plant, and rectified, if necessary.

USES : Oil of Peppermint is used as a stimulant, carminative and flavouring agent.

DISTRIBUTION : A herb frequently grown in Indian gardens. Rooted suckers

of the plant were obtained from the Punjab Agricultural College, Lyallpur, for trial cultivation in the Kashmir State. The plant has been successfully cultivated in Kashmir at the Baramula nursery. It is reported that the plant has also been successfully grown in the Nilgiris.

62. **Monarda punctata** Linn. (*Labiatae*)

THYMOL : Thymol is a crystalline phenol, obtained from the volatile oil of this plant or of *Thymus vulgaris* Linn., or of *Trachyspermum ammi* (Linn.) Sprague, or prepared synthetically.

USES : Thymol is antiseptic, germicidal and anthelmintic.

DISTRIBUTION : The plant is not found in India. Its cultivation may be tried in the temperate Himalayas in Kashmir at a place like Baramula.

63. **Myristica fragrans** Houtt. (*Myristicaceae*)

Vernacular names : Bengal—*Jayphal;* Hindi—*Jaiphal;* Tamil—*Sidam.*

NUTMEG, OIL OF NUTMEG : Nutmeg consists of the dried kernels of the seeds of this plant. Oil of Nutmeg is the oil distilled from Nutmeg.

USES : Nutmeg and Oil of Nutmeg are used for flavouring and as carminatives. Oil of Nutmeg is also used externally for rheumatism.

DISTRIBUTION : A tree cultivated in India to a very limited extent and did well in the Government Gardens at Burliar in the Coonoor valley on the eastern side of the Nilgiris and Courtallum hills further south. It is indigenous to the Moluccas and cultivated in Penang, Sumatra, the East Indies etc. Its cultivation may be tried near the sea both on the east and west coasts of India, especially the latter.

64. **Myroxylon pereirae** (Royle) Klotzsch (*Leguminosae*)

BALSAM OF PERU : Balsam of Peru is a viscid balsam, exuded from the trunk of this tree, after the bark has been beaten and scorched.

USES : Balsam of Peru is used as an antiseptic dressing for wounds and as a parasiticide.

DISTRIBUTION : The plant is not found in India. A tree growing in the forests of San Salvador in Central America. Its cultivation may be tried in south India near about Bangalore.

65. **Myroxylon toluifera** H.B. & K. (*Leguminosae*)

BALSAM OF TOLU : Balsam of Tolu is a solid, or semi-solid, balsam, obtained by incision from the trunk of this plant.

USES : Balsam of Tolu has antiseptic properties. It is a common ingredient of cough mixtures, to which it is added in the form of syrup or tincture.

DISTRIBUTION : The plant is not found in India. A tree indigenous to New Granada in South America. Its cultivation may be tried in south India and eastern Himalayas at places with fairly equable temperatures at altitudes between 1,500-3,000 ft.

66. **Olea europoea** Linn. (*Oleaceae*)
Vernacular names : Arabic—*Zaytoun;* Tamil—*Saidun.*

OLIVE OIL : Olive Oil is the fixed oil, expressed from the ripe fruits of this plant.

USES : Olive Oil is used in the preparation of soaps, plasters, etc., and is widely employed as a salad oil.

DISTRIBUTION : The plant is found in Baluchistan. A small tree cultivated in Spain, France, Italy and other countries bordering on the Mediterranean, also in California and South Australia. Its cultivation may be tried in the Himalayas in Kashmir and Himachal Pradesh.

67. **Papaver somniferum** Linn. (*Papaveraceae*)
Vernacular names : Bengal—*Post;* Bombay—*Post;* Hindi—*Afim;* Tamil—*Postaka.*

OPIUM : Opium is the latex, obtained by incision from the unripe capsules of this plant and dried by spontaneous evaporation.

USES : Opium is a narcotic and is used to relieve pain and is valuable as hypnotic.

DISTRIBUTION : An annual herb chiefly cultivated in Uttar Pradesh, districts of Jullunder and Hoshiarpur in the East Punjab and in various States in Rajputana and Central India. The plant is of course widely cultivated for ornamental purposes in gardens; *Assam*—Aka Hills; Manipur State; *Baroda*—Baroda College nursery Baroda; *Bihar*—Chapra; Gaya; Monghyr; Motihari; Patna; Tirhut; *East Punjab*—Ambala; Chamba; Gurgaon; Hoshiarpur; Jullunder; Kangra; Kapurthala State; Kasol (6,000 ft.), Kulu, Kangra Dist.; Kulu; Ludhiana; Simla; *Jammu and Kashmir State*—Doda; Kishtwar; Srinagar; *Madhya Bharat*—Bhopal; Bhopawar; Gwalior; Indore; *Rajasthan*—Alwar; Bikaner; Haraoti; Jaipur; Kotah; Merwar; Tonk; *Uttar Pradesh*—Aligarh; Allahabad; Azimgarh; Basti; Cawnpore; Chandbagh, Dehra Dun; Etawah; Faizabad; Farukhabad; Fatehgarh; Gazipur; Gonda; Gorakhpur; Jalaun; Lucknow; Mirzapur; Partabgarh; Rai Bareilly; Shajahanpur; Sitapur; Sultanpur.

68. **Physostigma venenosum** Balfour. (*Leguminosae*)

PHYSOSTIGMINE SALICYLATE : Physostigmine Salicylate is the salicylate of an alkaloid, physostigmine, obtained from the seeds of this plant.

USES : Physostigmine Salicylate is used in the form of an eye ointment or as lamellae for contracting the pupil of the eye.

DISTRIBUTION : The plant is not found in India. A woody climbing plant indigenous to the west coast of Africa. Its cultivation may be tried in the plains of south India on the banks of streams near sea coast and several other States.

69. **Picraena excelsa** (Sw.) Lindl. (*Simarubaceae*)

QUASSIA : Quassia is the stem-wood of this plant and is known in commerce as Jamaica quassia.

USES : Quassia is used as a bitter tonic and as an insecticide.

DISTRIBUTION : The plant is not found in India. A moderate sized tree indigenous to Jamaica. Its cultivation may be tried in the sub-tropical belt of the Himalayas from Jammu to Nepal at altitudes of 3,000-6,000 ft.

INDIAN SUBSTITUTE : **Picraena quassioides** Benth. (*Simarubaceae*)

Vernacular names : Bengal—*Bhurungi;* Hindi—*Bharangi;* Punjab—*Bering.*

DISTRIBUTION : A large scrambling shrub found in the sub-tropical Himalayas and Kashmir from altitudes of 3,000-8,000 ft. Also in the Khasi and Naga Hills in Assam at altitudes of 3,000-8,000 ft.; *Assam*—Barapani, Khasi and Jaintia Hills; Mairang, Khasi and Jaintia Hills; Mao (6,000 ft.), on border line of Manipur and Naga Hills; Naga Hills; Shillong, Khasi and Jaintia Hills; *Bhutan State*—Bhutan; *East Punjab*—Chamba; Chansil range, Bashahr State, Simla Dist.; Kulu, Kangra Dist.; Manglad Gad (4,500 ft.), Bashahr State, Simla Dist.; Shechi (6,200 ft.), Bashahr State, Simla Dist.; Taranda range, Bashahr State, Simla Dist.; *Uttar Pradesh*—Bamsu Reserve (5,000-6,000 ft.); Chakrata (7,000 ft.), Dehra Dun Dist.; Deota (7,000 ft.), Tehri Garhwal; Joshimath (6,400 ft.), Garhwal; Kulni, Tehri Garhwal; Mundali (5,000 ft.), Dehra Dun Dist.; Mussoorie; Nakraunda, Dehra Dun; Oura (6,000 ft.), Tehri Garhwal; Ramni (5,500 ft.), Garhwal; Tapoban, Garhwal; Tons valley (6,000 ft.), Tehri Garhwal.

70. **Pilocarpus microphyllus** Stapf (*Rutaceae*)

PILOCARPINE NITRATE : Pilocarpine Nitrate is the nitrate of an alkaloid, pilocarpine, obtained from the leaves of this plant, and other species of *Pilocarpus.*

USES : Pilocarpine Nitrate is employed as a diaphoretic and sialagogue. It causes contraction of the pupil of the eye, its action being antagonistic to that of atropine.

DISTRIBUTION : The plant is not found in India. A tree indigenous to Brazil. Its cultivation may be tried in the tropical rain forests of Bengal specially in the Teesta valley near Darjeeling.

71. **Pimpinella anisum** Linn. (*Umbelliferae*)

Vernacular names : Bengal—*Muhuri;* Bombay—*Sonf;* Tamil—*Shombu.*

OIL OF ANISE : Oil of Anise is the oil distilled from the dried ripe fruits of this plant, or from the dried fruits of the star anise, *Illicium verum* Hook. f.

USES : Oil of Anise is used as a flavouring agent and carminative.

DISTRIBUTION : An annual herb cultivated in some parts of the Punjab, Uttar Pradesh and to a small extent in Orissa.

72. **Pinus** species. (*Coniferae*)

COLOPHONY : Colophony is the residue left after distilling the volatile oil from the oleo-resin obtained from various species of *Pinus*.

USES : Colophony is used in the preparation of plasters, ointments, etc. It is also employed in the manufacture of linoleum and dark varnishes.

DISTRIBUTION : The oleo-resin is generally obtained from *Pinus palustris* Mill. and *Pinus taeda* Linn. These are not found in India, and grow in Europe and the United States of America. Their cultivation may be tried in the outer ranges of the temperate Himalaya at altitudes from 5,000-12,000 ft.

INDIAN SUBSTITUTE : **Pinus longifolia** Linn. (*Coniferae*)

Vernacular names : Bengal—*Saralagach;* Hindi—*Chil;* Tamil—*Simaidevadari.*

DISTRIBUTION : A large more or less deciduous tree of the outer and drier Himalayan slopes and Siwalik Range, also valleys of the principal Himalayan rivers at 1,500-7,500 ft., extending from the Indus to Bhutan. It is also cultivated in the plains of north west India and grows even at Calcutta; *Assam*—Balipara Frontier tract (2,000 ft.); *Bihar*—Purneah (Cult.); Ranchi (Cult.); Sameshwar hills, Champaran; *East Punjab*—Chamba; Hoshiarpur (Cult.); Kasol (5,000 ft.), Parbatti valley, Kulu, Kangra Dist.; Kasauli; Nurpur, Kangra Dist.; Simla; *Jammu and Kashmir State*—Kathua; Kotli; Mirpur; Muzaffarabad; Ramnagar; Reasi; Udhampur; *Sikkim State*—Sikkim; *Uttar Pradesh*—Allahabad (Cult.); Kathian (6,000 ft.), Jaunsar; Khirsu (4,000 ft.), Garhwal Dist.; Naini Tal; Ranikhet, Almora Dist.; Sidh Dhar (4,500 ft.), Naini Tal Dist.; Surajbagh Experimental Farm, Dehra Dun; Tons valley (3,000 ft.), Jaunsar; *West Bengal*—Badamatam, Darjeeling Dist.; Great Rangit river, Darjeeling Dist.; Reyang forests, Darjeeling Dist.

73. **Podophyllum emodi** Wall. (*Berberidaceae*)

Vernacular names : Hindi—*Papra;* Kashmir—*Banwangan;* Punjab—*Ban kakri.*

INDIAN PODOPHYLLUM : Indian Podophyllum consists of the dried rhizome and roots of the plant.

USES : Indian Podophyllum is used for the preparation of the resin which is a drastic, but slowly acting, purgative.

DISTRIBUTION : A small herb met with in the higher rich and shady temperate forests of the Himalayas from Sikkim to Hazara at altitudes of about 7,000-14,000 ft., but in Kashmir it occurs as low down as 6,000 ft. It chiefly abounds on the northern slopes of the outer ranges. It is less abundant on the eastern than on the central and western Himalayas. It is also plentiful on the northern forest-clad slopes of the Shali hills, east of Simla. In the higher ranges of Kangra, Kulu and Chamba, there are many rich forests whose glades are almost exclusively covered with this herb; *East Punjab*—Chulkot forest (10,000 ft.), Chamba State; Haranghati Pass (10,800 ft.), Bashahr State; Kala Tope forest (8,000 ft.), Chamba State; Kilar, Pangi, Chamba State; Kulu, Kangra Dist.; Lahul, Kangra Dist.; Matiana, Simla Dist.; Narkanda, Simla Dist.; Pandra Bis (8,000 ft.), Bashahr State; Pangi, Chamba State; Pulga (8,000 ft.), Kulu, Kangra Dist.; Sach Pass to Kilar, Pangi, Chamba State; Sauch valley, Chamba State; Shali, Simla Dist.; Simla; *Jammu and Kashmir State*—Daitwas forest; Gilgit; Gulmarg (9,000-10,000 ft.); Jagran river bank between Kundi and Shikar (10,000-12,000 ft.), Kishenganga valley; Jhelum basin (8,000-9,000 ft.); Khelanmarg (9,000-10,000 ft.); Lidwas; Muzaffarabad Range forests (8,000 ft.), Kishenganga valley; Sind valley; Tangmarg forest (7,200-8,700 ft.); Zaskar (11,500 ft.); Zoji La (11,500 ft.); *Sikkim State*—Chamnaga (12,000 ft.); Sikkim; Thangu; *Uttar Pradesh*—Bodyar (7,800 ft.), Jaunsar, Dehra Dun Dist.; Dasoli, Garhwal Dist.; Deoban (9,000 ft.), Jaunsar Bawar, Dehra Dun Dist.; Jamnotri, Tehri Garhwal State; Kanjatra (8,500 ft.), Jaunsar, Dehra Dun Dist.; Kidarkanta (10,000-11,000 ft.), Tehri State; Konain, Jaunsar Bawar, Dehra Dun Dist.; Kuthi Yankti valley (12,000-13,000 ft.), Almora Dist.; Mundali (7,500 ft.), Jaunsar Bawar, Dehra Dun Dist.; Pindari glacier, Almora Dist.; Rudugaria Gadh (13,000-14,000 ft.), Tehri Garhwal.

74. **Podophyllum peltatum** Linn. (*Berberidaceae*)

PODOPHYLLUM : Podophyllum consists of the dried rhizome and roots of this plant.

USES : Podophyllum is used, mainly in the form of resin, as a drastic, but slow acting, purgative.

DISTRIBUTION : The plant is not found in India. A small herb common in the eastern United States of America and Canada. Its cultivation may be tried in the temperate forests on the lower slopes of the Himalayas.

75. **Polygala senega** Linn. (*Polygalaceae*)

SENEGA : Senega is the dried root of this plant.

USES : Senega is used as a stimulant expectorant in chronic bronchitis. It is often prescribed with other expectorants such as ipecacuanha and ammonium carbonate.

DISTRIBUTION : The plant is not found in India. A herbaceous plant indigenous to southern Canada and the United States of America. Its cultivation may be tried in the temperate Himalayas at 4,000-7,000 ft. and at somewhat lower altitudes also.

INDIAN SUBSTITUTE : **Polygala chinensis** Linn. (*Polygalaceae*)

Vernacular names : Hindi—*Meradu.*

DISTRIBUTION : A stout herb found growing wild throughout India up to 5,000 ft.; *Assam*—Khasi Hills; Mishmi Hills; *Bihar*—Chota Nagpur; Darbhanga; Manbhum Dist.; Monghyr; Nathpur; *Bombay State*—Belgaum; Devgad Bariya, Panch Mahals; Gujarat; Poona; Southern Marahatta country; Taloda, West Khandesh Dist.; *East Punjab*—Chamba (3,000 ft.), Chamba to Masrund (3,000 ft.); Kalhel (4,000 ft.), Chamba State; Keonthal, Simla Hills; Kulu, Kangra Dist.; Masrund Chamba State; Pathankot (1,500 ft.), Gurdaspur Dist.; Simla, in valleys; Solan; *Madhya Pradesh*—Chanda; Ghisul, Khandwa Dist.; *Madras State*—Bellary (500 ft.); Bolampati valley (1,600 ft.), Coimbatore Dist.; Chingleput Dist.; Courtallum, Chingleput Dist.; Cuddapah Dist.; Ganjam Dist.; Kotagiri (1,600 ft.), Nilgiri Dist.; Madras; Rampa, Godavari Dist.; Shevaroy Hills, Salem Dist.;

Tekkadi, Malabar Dist.; *Mysore*—Mysore; *Uttar Pradesh*—Agra; Allahabad; Almora (4,000-5,000 ft.); Banda; Dehra Dun; Dharasu to Dunda (3,000-4,000 ft.), Ganges valley, Tehri Garhwal; Hamirpur; Jalaun; Jhansi; Moradabad; Nandgaon (5,000 ft.), Jumna valley, Tehri Garhwal; *Travancore State*—Muthukuzivayal (4,200 ft.); Trivandrum.

76. **Prunus amygdalus** Batsch. var. *dulcis* (D.C.) Koehne or **Prunus amygdalus** Batsch. var. *amara* (D.C.) Focke. (*Rosaceae*)

Vernacular names : Bengal—*Bilati badam;* Hindi—*Badam;* Tamil—*Vadumai.*

ALMOND OIL : Almond Oil is the fixed oil, obtained from the seeds of any of these plants.

USES : Almond Oil is used in the preparation of many toilet articles. When taken internally it has a mild, laxative action.

DISTRIBUTION : *Prunus amygdalus* is indigenous in W. Asia and the Kuram Valley. These plants are grown in Baluchistan, Kashmir and the Punjab, also in Afghanistan, Persia and the Mediterranean region.

77. **Prunus serotina** Ehrh. (*Rosaceae*)

WILD CHERRY BARK : Wild Cherry Bark is the bark of this plant collected in the autumn.

USES : Wild cherry is mainly used in cough preparations, to which it gives mild sedative properties and a pleasant taste.

DISTRIBUTION : The plant is not found in India. Work done on the various species of *Prunus* growing in Kashmir show that these are not suitable as substitutes for the official plant. It is a tree widely distributed over North America, particularly in the northern and central States. Its cultivation may be taken up in the western temperate Himalayas in Kashmir and Kumaon.

78. **Punica granatum** Linn. (*Lythraceae*)

Vernacular names : Bengal—*Dalimgachh;* Bombay—*Dalimba;* Hindi—*Anar;* Tamil—*Madulam.*

PELLETIERINE TANNATE : Pelletierine tannate is a mixture of the tannates of the alkaloids, obtained from the bark of the root and stem of this plant.

USES : Pelletierine tannate is used as taenifuge.

DISTRIBUTION : A small tree or large shrub cultivated throughout India and wild in north-west India; *Assam*—Shilong; *Bihar*—Chota Nagpur; Hazaribagh; Ranchi; *Bombay State*—Alandi near Poona; Poona College garden; Sholapur; *East Punjab*—Amritsar; Chamba; Dalhousie, Gurdaspur Dist.; Hoshiarpur; Kalhel to Tisa (5,000 ft.), Chamba State; Kasol, Kulu, Kangra Dist.; Simla; *Madhya Pradesh*—Jubbulpore; *Jammu and Kashmir State*—Chenani forest, Tawi valley; Jammu; Muzaffarabad (3,000 ft.), Kishenganga valley; Poonch; Srinagar; *Madras State*—Yercaud, Salem Dist.; *Uttar Pradesh*—Almora; Chakrata, Dehra Dun Dist.; Dehra Dun; Dudwa, Kheri Dist.; Laluri (3,000-4,000 ft.); Mussoorie (5,000-6,000 ft.); Thadiar (5,000 ft.), Tehri Garhwal.

79. **Quercus** sp. (*Cupuliferae*)

TANNIC ACID : Tannic acid may be obtained from the galls of various species of Quercus, by subjecting them to a special fermentation, and extracting them with water-saturated ether.

USES : Tannic acid is used as an astringent and in the treatment or burns.

DISTRIBUTION : Quercus species are found both in the eastern and western temperate Himalayas in India, and on investigation substitutes may also be found in several parts of India.

80. **Quillaja saponaria** Molina. (*Rosaceae*)

QUILLAIA : Quillaia is the dried inner part of the bark of this plant and other species of *Quillaja.*

USES : Quillaia is irritant, expectorant and detergent. Also used as an emulsifying agent, particularly for tars.

DISTRIBUTION : A tree which has been introduced and is cultivated for ornamental purposes in the North-West Frontier Province. Its cultivation can be expanded in these parts.

81. **Rhamnus purshiana** DC. (*Rhamnaceae*)

CASCARA SAGRADA : Cascara sagrada is the dried bark of this plant, collected at least one year before being used.

USES : Cascara Sagrada is a valuable laxative.

DISTRIBUTION : The plant is not found in India. It is a shrub growing in North California, Oregon, Washington and British Columbia. Its cultivation is likely to do well in the temperate Himalayas with moderate or even low rainfall in places like Kashmir and Himachal Pradesh.

Rhamnus virgatus obtained from the Sind valley in Kashmir was found unsuitable as a substitute for the official plant.

82. **Rheum palmatum** Linn. (*Polygonaceae*)

RHUBARB : Rhubarb is the rhizome of this plant and possibly other species of *Rheum,* cultivated in China and Tibet, deprived of most of its bark, and dried.

USES : Rhubarb is used as a bitter stomachic and in the treatment of diarrhœa, purgation being followed by an astringent effect. The drug is suitable as an occasional aperient, but not for the treatment of chronic constipation.

DISTRIBUTION : The plant is not found in India. A herb cultivated in China and Tibet. Its cultivation may be taken up in the west Himalayas and the range of Sikkim Himalayas between 9,000-15,000 ft.

INDIAN SUBSTITUTE : (i) **Rheum emodi** Wall. (*Polygonaceae*)

Vernacular names : Bengal—*Banglarevanchi;* Bombay—*Ladakirevandachini;* Hindi—*Hindi revandchini;* Tamil—*Nattirevalechinni.*

DISTRIBUTION : A herb found growing wild in the Himalayas, in various parts of Nepal and Sikkim at altitudes of 11,000-12,000 ft., Simla on the Chor and the Kangra Dist.; *East Punjab*—Bashahr

State, Simla Hills; Chor, Simla; Lahul, Kangra Dist.; Marali, Simla Dist.; Tos Nal (9,600 ft.), Parbatti valley; Kulu, Kangra Dist.; *Jammu and Kashmir State*—Baltistan, Ladakh; Daitwas forests, Kashmir North; Gulmarg; Jhelum valley; Kamri; Khelanmarg; Sind valley; *Sikkim State*—Sikkim; *Uttar Pradesh*—Gangotri (11,000-12,000 ft.), Tehri Garhwal; Harki Dun, Dehra Dun Dist.

INDIAN SUBSTITUTE : (ii) **Rheum webbianum** Royle (*Polygonaceae*)

Vernacular names : Garhwal—*Archu;* Ladak—*Lachu;* Nepal—*Padamchal.*

DISTRIBUTION : A herb very variable in size from 1 to 6 ft. high found growing wild in the central and western alpine Himalayas, from Nepal to Kashmir at altitudes of 10,000-14,000 ft.; *East Punjab*—Dilling Garang (10,000 ft.), Bashahr State, Simla Hills; Langera (above), Chamba State; *Jammu and Kashmir State*—Burzil (11,300 ft.); *Uttar Pradesh*—Kuthi Yankti valley, Byans (12,000-13,000 ft.), Almora Dist.; Nabbi (valley above), Byans (12,000-13,000 ft.), Almora Dist.

83. **Ricinus communis** Linn. (*Euphorbiaceae*)

Vernacular names : Bengal—*Bherenda;* Bombay—*Erendi;* Hindi—*Arend;* Tamil—*Attagam.*

CASTOR OIL : Castor Oil is the fixed oil expressed from the seeds of this plant.

USES : Castor oil is used as a purgative.

DISTRIBUTION : An ever-green bush or small tree cultivated throughout India and often found wild in the fields, gardens, village thickets, by roadsides and on waste lands; *Assam*—Abor Hills; Shillong, Khasi and Jaintia Hills; *Baroda*—Baroda; *Bihar*—Bhagalpore; Hajeepur, Muzaffarabad Dist.; Monghyr; Patna; Purnea; Ranchi; Sitamarhi; *Bombay State*—Ahamedabad; Ahamadnagar; Kanara; Khandesh; Kolhapur; Rajkot, Kathiawar; Satara; Surat; *East Punjab*—Ambala; Hoshiarpur; *Jammu and Kashmir State*—Jammu; Muzaffarabad (2,500 ft.), Kishenganga valley; *Madras Presidency*—Anantpur; Bellary; Coimbatore; Cuddapah; Kurnool; Kistna; Madras; Nellore; *Orissa*—Cuttack; *Travancore State*—Quilon; *Uttar Pradesh*—Allahabad (by the Jumna river); Banda; Dehra Dun New forest; Kilpura, Naini Tal Dist.; Mahurena, Kheri Dist.; Moradabad;

West Bengal—Agartala, Tripura State; Jessore; Nadia; Sibpur near Calcutta.

84. **Rosmarinus officinalis** Linn. (*Labiatae*)

OIL OF ROSEMARY : Oil of Rosemary is the oil distilled from the flowering plant.

USES : Oil of rosemary has carminative properties and is used in hair lotions for its odour and for its supposed effect in stimulating the growth of hair.

DISTRIBUTION : A shrub cultivated in India chiefly in the gardens of Europeans and Botanic gardens as the Ootacamund Government Botanic garden. It is indigenous to southern Europe and grows abundantly on dry, rocky hills in the Mediterranean regions. Its cultivation may be taken up in the plains of India with equable climate but is likely to do better in the temperate Himalayas with dry to moderate moist climate.

85. **Saccharum officinarum** Linn. (*Gramineae*)

Vernacular names : Bengal—*Ganna;* Bombay—*Gol;* Hindi—*Ganna;* Tamil—*Kalai.*

SUCROSE : Sucrose may be obtained from the juice of this plant or from *Beta* species.

USES : Sucrose is used as a nutrient, diuretic, food preservative, and sweetening agent.

DISTRIBUTION : A strong cane-stemmed grass commonly cultivated everywhere in India.

86. **Salix** sp. and **Populus** sp. (*Salicaceae*)

(B.P. 1932)

SALICIN : Salicin is a glucoside, which may be obtained from the bark of various species of *Salix* and *Populus,* but the principal commercial sources of the glucoside appear to be *S. fragilis* Linn. and *S. purpurea* Linn.

USES : Salicin is used for rheumatisms, influenza, ague, malaria and certain chronic skin diseases.

DISTRIBUTION : *Salix fragilis* is a moderate sized bushy tree cultivated in

Lahul (Kangra Dist), Pangi (Chamba State), and Ladakh (Jammu and Kashmir State). *Salix purpurea* is not found in India, but its cultivation may be tried at the above mentioned localities where *Salix fragilis* is cultivated.

87. **Santalum album** Linn. (*Santalaceae*)

Vernacular names : Bengal—*Chandan;* Bombay—*Chandan;* Hindi—*Chandan;* Tamil—*Ingam.*

Oil of Sandal Wood : Oil of Sandal Wood is the oil distilled from the dried heart-wood of this plant.

Uses : Oil of Sandal Wood is used in the sub-acute stages of cystitis and gonorrhœa as it is a genito-urinary stimulant and disinfectant. It is also used in perfumery.

Distribution : A small evergreen tree met with in the dry, open regions of south India (Mysore, Malabar, Coorg, South Maratha, Hyderabad, Karnatik, Nilgiri hills, Western Ghats, Coimbatore) and in the Northern India chiefly, as a cultivated plant. Also in the dry district of the Bombay State from Nasik southwards; *Baroda*—Baroda College botanical garden, Baroda; *Bombay State*—Dharwar; Madosa, Ahmadabad; *Madhya Pradesh*—Borsal, Nimar Dist.; Jalandhar Reserve, Saugor Dist.; Saugor; *Madras State*—Arcot, North Arcot Dist.; Javadi Hills, North Arcot Dist.; Karadigudda, Nilgiris Dist.; Kodur, Cuddapah Dist.; Kollaimalais, Salem Dist.; Komuttikollai (2,400 ft.), Javadi Hills, Arcot Dist.; Madras; Madura; Naterikal (4,000 ft.), Tinnevelly Dist.; Ramapakkam, South Arcot Dist.; Sandur (2,000 ft.), (State); Shevaroy Hill, Salem Dist.; *Mysore*—Mysore; Somnathapur; Talamalai (2,800 ft.), Shimoga Dist.; *Travancore State*—Achankovil; Quilon; Varkkallai; *Uttar Pradesh*—Bhira range, Kheri Dist.; Dehra Dun, Chandbagh garden; Dehra Dun, New Forest; *West Bengal*—Sibpur Royal Botanic Garden near Calcutta.

88. **Sesamum indicum** Linn. (*Pedaliaceae*)

Vernacular names : Bengal—*Til;* Bombay—*Til;* Hindi—*Til;* Tamil—*Ellu.*

Sesame Oil : Sesame Oil is the fixed oil, expressed from the seeds of this plant.

USES : Sesame oil is used as emollient and nutrient, as a substitute for olive oil.

DISTRIBUTION : An annual herb which is widely cultivated throughout India. In India it would perhaps be more correctly described as a crop of the warm temperate and sub-tropical tracts, being grown as an autumn or even as a winter crop in the warmer parts of the country (the truly tropical areas) and as a summer one in the colder. It is sometimes found wild and as escapes in waste lands.

89. **Strophanthus kombe** Oliver (*Apocynaceae*)

STROPHANTHUS : Strophanthus consists of the dried ripe seeds of this plant, freed from the awns.

USES : Strophanthus is a cardiac stimulant and diuretic.

DISTRIBUTION : The plant is not found in India. A climbing plant indigenous to tropical East Africa. Its cultivation is likely to do well in the moist tropical regions of south India. It is possible it may do well in the drier places also.

Seeds secured from Australia for experimental cultivation have not given encouraging results so far in Jammu and Kashmir Province.

90. **Strychnos nux-vomica** Linn. (*Loganiaceae*)

Vernacular names : Bengal—*Kuchila;* Bombay—*Kara;* Hindi—*Kuchla;* Tamil—*Karalam.*

NUX-VOMICA : Nux-Vomica consists of the dried ripe seeds of this plant.

USES : The action of the whole drug closely resembles that of strychnine. The alkaloid is used as a circulatory stimulant in surgical shock, etc., and is valuable in certain cases of poisoning. Like other bitters strychnine improves the appetite and digestion, but it has been considerably misused as a general tonic.

DISTRIBUTION : A small tree grows wild throughout India up to an altitude of 4,000 ft. in the Madras State, Cochin, Travancore, Coromandel coast, Bengal, Bihar and Orissa; *Bombay State*—Kanara Division; *Madras State*—Anamalai Hills;

Basavapuram (1,000 ft.), Kurnool Dist.; Dandeli Kalinadi, North Kanara Dist.; Gokaram, Godavari Dist.; Kadirinenipalle, Nellore Dist.; Kistna Dist.; Madras garden; Mahabalipur, Madras; Rampa hills (1,000-3,000 ft.), Godavari Dist.; Ranandavady Reserve, Changam Range, North Arcot Dist.; Uppinangadi, South Kanara Dist.; Vellore South, North Arcot Dist.; Yetti, North Arcot Dist.; *Orissa*—Barakuda Island, Ganjam Dist.; Cuttack; Rajabari Island, Ganjam Dist.; *Travancore State*—Puliyara; *Uttar Pradesh*—Chauk Gorakhpur; Gorakhpur; Lucknow gardens; Saharanpur Botanic garden; Surajbagh experimental Farm, Dehra Dun; *West Bengal*—Sibpur, Royal Botanic Garden, Calcutta.

91. **Styrax benzoin** Dryand.
S. paralleloneurus Brans } (*Styraceae*)
S. tonkinensis Craib

BENZOIN : Benzoin is a balsamic resin, obtained from the incised stems of *Styrax benzoin* and *Styrax paralleloneurus* known in commerce as Sumatra benzoin or from the incised stem of *Styrax tonkinensis* known in commerce as Siam benzoin.

USES : Benzoin, when taken internally, acts as an expectorant and antiseptic. It is mainly used as an ingredient of Friar's Balsam, or as a cosmetic lotion prepared from a simple tincture.

DISTRIBUTION : The plant is not found in India. The trees are cultivated in Sumatra and Siam. *Styrax benzoin* has been known to be successfully grown in the Government Gardens, Bangalore. The cultivation of the trees will do well in several other places in South India.

Styrax hookeri Clarke growing in Assam when tapped did not yield resin; it is unsuitable as a substitute for the official plant.

92. **Tamarindus indica** Linn. (*Leguminosae*)
Vernacular names : Bengal—*Tentul;* Bombay—*Amli;* Hindi—*Imli;* Tamil—*Amilam.*

TAMARIND : Tamarind consists of the fruits of this plant, freed from

the brittle outer part of the pericarp, and preserved with sugar.

USES : Tamarind is used as a laxative and refrigerant and in the preparation of confection of senna.

DISTRIBUTION : A large evergreen tree cultivated throughout India as far north as Amritsar, in Madhya Pradesh, Central India and many parts of southern India; it is also found self-sown in waste and forest lands; *Assam*—Barni, Kamrup Dist.; Naga Hills; Sibsagar; *Bombay State*—Ahmedabad; Bijapur; Dharwar; Poona; *Delhi*—Delhi; *East Punjab*—Amritsar; Hoshiarpur; *Madhya Bharat*—Guna, Isagarh Dist.; Gwalior; *Madras State*—Coimbatore; Madras; Sangam Hill, Nellore Dist.; *Rajputana*—Ajmer; *Travancore*—Trivandrum; *West Bengal*—Agartala, Tripura State.

93. **Theobroma cacao** Linn. (*Sterculiaceae*)

OIL OF THEOBROMA : Oil of Theobroma is the solid fat, expressed from the roasted seeds of this plant.

USES : Oil of Theobroma is used in pharmacy chiefly as a suppositary base.

DISTRIBUTION : A tree cultivated to some extent in the Southern State in suitable places, as on the Malabar coast and in the Nilgiri valleys; *Bombay State*—Bombay Victoria gardens; *Madras State*—Barliyar, Nilgiris; Malabar coast; Tinnevelly.

94. **Thymus vulgaris** Linn. (*Labiatae*)

THYMOL : Thymol is a crystalline phenol, obtained from the volatile oil of this plant, or of *Monarda punctata* Linn. or of *Trachyspermum ammi* (Linn.) Sprague, or prepared synthetically.

USES : Thymol is antiseptic, germicidal and anthelmintic.

DISTRIBUTION : The plant is cultivated in Botanical gardens as in Ootacamund. A low aromatic shrub of southern Europe. Its cultivation may be tried in the western temperate Himalayas from Kashmir to Kumaon between 5,000-13,000 ft.

95. **Trachyspermum ammi** (Linn.) Sprague
(*Umbelliferae*)

Vernacular names : Bengal—*Jowan;* Bombay—*Ajwan;* Hindi—*Ajwain;* Tamil—*Amam.*

THYMOL : Thymol is a crystalline phenol, obtained from the volatile oil of this plant, or of *Monarda punctata* Linn., or of *Thymus vulgaris* Linn. or prepared synthetically.

USES : Thymol is antiseptic, germicidal and anthelmintic.

DISTRIBUTION : A herb widely cultivated in India on account of its seed; from the Punjab and Bengal to south Deccan. It is particularly abundant in and around Indore and in the Hyderabad State. Found occasionally as an escape but nowhere truly wild; *Baroda*—Baroda; *Bombay State*—Sholapur; *Uttar Pradesh*—Banda; Dehra Dun, New Forest; Fatehgarh on banks of Ramganga river, Farrukhabad Dist.; *West Bengal*—Agartala, Tripura; Sibpur, Royal Botanic Garden; Calcutta; Taki, 24-Parganas Dist.

96. **Uncaria gambier** (Hunter) Roxb. (*Rubiaceae*)

Vernacular names : Hindi—*Kathkutha.*

CATECHU : Catechu is a dried aqueous extract, prepared from the leaves and young shoots of the plant.

USES : Catechu is used in medicine as an astringent and for dyeing and tanning.

DISTRIBUTION : The plant is not found in India. A climbing shrub indigenous to and cultivated in the Malay Archipelago. Its cultivation may be tried in the tropical regions of India, Eastern Bengal, Chittagong and Khasia mountains.

INDIAN SUBSTITUTE : **Acacia catechu** Willd. (*Leguminosae*)

Vernacular names : Bengal—*Kuth;* Bombay—*Khaira;* Hindi—*Khair;* Tamil—*Karungali.*

DISTRIBUTION : A tree found in most parts of India extending to the sub-Himalayan tract westward to the Indus and eastward to Sikkim ascending to an altitude of 4,000-5,000 ft.; *Assam*—Darrang; Gauhati, Kamrup Dist.; Khasi and Jaintia Hills; Ranikhata, Goalpara Dist.; Sadiya; Sibsagar; *Baroda*—Baroda; *Bihar*—Chota Nagpur; Gaya; Hazaribagh; Monghyr;

Rajmahal near Sahibganj, Santal Parganas Dist.; Saidap Reserve, Palamau Dist.; *Bombay State*—Ahmedabad; Broach forests; Chandansur, Bassein, Thana Dist.; Gujarat; Kanara North; Khandesh; Konkan; Panchmahal forests; Poona; South Marhata country; Surat; *East Punjab*—Hoshiarpur; Kangra; *Jammu and Kashmir State*—Billawar; Jammu; *Madhya Bharat*—Guna, Isagarh Dist.; Gwalior; *Madhya Pradesh*—Bilaspur forests; Chanda North; Damoh Forest Division; Jubbulpore Forest Division; Raipur Forest; Saugor Forest Division; *Madras State*—Arpalaiyam, Coimbatore Dist.; Lakshmipuram, Vizagapatam Dist.; Malabar South; North Circars; *Mysore*—Mysore; *Orissa*—Angul; Aska, Ganjam Dist.; Kodopodoro, Ganjam Dist.; *Rajputana*—Mount Abu; *Travancore State*—Anjinad; Nanjinad; *Uttar Pradesh*—Adnala range, Garhwal Dist.; Aglar valley near Mussoorie; Bahraich; Banda; Bhabar tract, Naini Tal Dist.; Dehra Dun; Gonda; Gorakhpur; Kalpi, Jalaun Dist.; Malari Reserve Forest, Garhwal Dist.; Raipur, Dehra Dun; Saharanpur Siwaliks; Sarju valley 3,000-4,000 ft., Kumaon; *West Bengal*—Mahanadi river banks, Darjeeling Tarai; Sibpur, Botanic Garden, Calcutta; Siliguri, Darjeeling Dist.

97. **Urginea maritima** (Linn.) Baker (U. scilla Steinh.) (*Liliaceae*)

SQUILL : Squill is the bulb of this plant divested of its dry membranous outer scales, cut into slices, and dried.

USES : Squill has a digitalis like action on the heart and in small doses is used as an expectorant. In large doses it is emetic. It is also used as a rat poison.

DISTRIBUTION : The plant is not found in India. A perennial herb indigenous to the Mediterranean region in sandy and hilly localities. Its cultivation may be tried in places where the Indian scillas grow, that is, in sandy soil near the sea or in the drier hills of the lower Himalayas up to an altitude of about 3,000 ft.

INDIAN SUBSTITUTE : **Urginea indica Kunth** (*Liliaceae*)

Vernacular names : Bengal—*Ban piaz;* Bombay—*Jangli piaz;* Hindi—*Jangli piaz;* Tamil—*Narivengayam.*

DISTRIBUTION : A herb found in the western Himalayas up to 7,000 ft.,

Garhwal, Kumaon, Bihar and the sandy shores of Konkan and Coromandel coast; *Bihar*—Mayurbhanj (State); Palamau; Rajmahal Hills, near Sahibganj, Santal Parganas Dist.; Ranchi; Singhbhum; *Bombay State*—Harni on the coast below Bombay; *East Punjab*—Sabathu, Simla; Simla below 5,000 ft.; *Madras State*—Anamalais Hill (1,400 ft.); Coimbatore Dist.; *Orissa*—Angul; *Uttar Pradesh*—Almora outer hills; Dhara Range, Garhwal; Jhansi Division; Pilibhit sub-Himalayan tract; Pindar valley; Garhwal (4,500 ft.); Pipra, Gonda Dist.; Thadiar valley (3,000-4,000 ft.), Tehri Garhwal; Tons valley (3,000-4,000 ft.), Tehri Garhwal; *West Bengal*—Sibpur, Royal Botanic Garden, Calcutta (cultivated).

98. **Valeriana officinalis** Linn. (Valerianaceae)

Vernacular names : Marathi—*Kalavala.*

VALERIAN : Valerian consists of the rhizome and roots of this plant, collected in the autumn, and dried.

USES : Valerian is used as a carminative and antispasmodic in hysteria, shell-shock, and other nervous disorders.

DISTRIBUTION : A perennial herb found in North Kashmir at altitudes of 8,000-9,000 ft. but not so common as *W. wallichii.*

INDIAN SUBSTITUTE : **Valeriana wallichii** DC. (*Valerianaceae*)

Vernacular names : Hindi—*Mushkbala;* Kashmir—*Mushkbala;* Sanskrit—*Tagara.*

DISTRIBUTION : A perennial herb found in the temperate Himalayas, grows abundantly from Kashmir to Bhutan at altitudes of 4,000-12,000 ft., and Khasia mountains at altitudes of 4,000-6,000 ft.; *Assam*—Chingsao (5,000-6,000 ft.), Manipur; Dympep to Sohrarim, Khasi and Jaintia Hills; Khasi and Jaintia Hills (3,000-6,000 ft.); Kohima (6,000-7,000 ft.), Naga Hills; Manipur; Mylliem to Dympep, Khasi and Jaintia Hills; Peak forests (6,000 ft.), Khasi and Jaintia Hills; Shillong (4,200-6,000 ft.), Khasi and Jaintia Hills; Sohrarim (4,000 ft.), Khasi and Jaintia Hills; *East Punjab*—Chamba; Dhar (9,000 ft.), Parbati valley, Kangra Dist.; Mashobra, Simla Hills; Rohtang Pass, Kulu, Kangra Dist.; *Jammu and Kashmir State*—Baltal (9,000 ft.), Sind valley; Deo Masjid valley (12,000-13,000 ft.); Dras (10,000 ft.); Lidder valley (4,000-8,000 ft.); Zebanwan mountain; *Uttar Pradesh*—

Deota (8,000-9,000 ft.), Tehri Garhwal; Kharamba above Mundali, Dehra Dun Dist.; Kuari Pass (12,000-13,000 ft.), Garhwal; Kuthi Yankti valley (11,000-12,000 ft.), Almora Dist.; Landour, Dehra Dun Dist.; Mundalin forests (8,000-9,000 ft.), Dehra Dun Dist.; Mussoorie; Mussoorie road to Kemti Falls; Naini Tal; Palanggadh, Byans, Almora Dist.; Phedi (4,000-5,000 ft.), Tehri Garhwal; Ramni (7,000-8,000 ft.); Garhwal; *West Bengal*—Darjeeling Hills; Kumai, Darjeeling.

99. **Zea mays** Linn. (*Gramineae*)

Vernacular names: Bengal—*Bhutta;* Bombay—*Makai;* Hindi—*Makai;* Tamil—*Makkasholam.*

STARCH: Starch consists of polysaccharide granules, obtained from the grains of maize, *Zea mays* Linn., of rice, *Oryza sativa* Linn., or of wheat, *Triticum aestivum* Linn., or from the tubers of the potato, *Solanum tuberosum* Linn.

USES: Starch is a nutrient and demulcent. It is employed pharmaceutically as a base for dusting powders and insufflations, as a dusting powder for uncoated pills to prevent them adhering to each other and, in the form of glycerite, as an emmolient and base for suppositories.

DISTRIBUTION: Maize, rice, wheat and potato are widely cultivated in India.

100. **Zingiber officinale** Roscoe (*Scitamineae*)

Vernacular names: Bengal—*Ada;* Bombay—*Adu;* Hindi—*Adrak;* Tamil—*Sangai.*

GINGER: Ginger is the rhizome of this plant, scraped to remove the dark outer skin, and dried in the sun.

USES: Ginger is used as a carminative, stimulant and condiment.

DISTRIBUTION: A perennial herb cultivated in almost every State of India. Large scale cultivation for commercial purposes is carried out in the west coast of Madras, Bombay and to some extent in Bihar. Malabar in Madras, the districts of Thana, Surat, Ahmedabad, Kaira and Satara in Bombay and Rangpur in Bihar are important centres of production.

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